ANNEXURE-II

SCHEME AND SYLLABUS FOR RECRUITMENT TO THE POST OF ASSISTANT ENVIRONMENTAL ENGINEER IN TELANGANA POLLUTION CONTROL BOARD

SCHEME OF EXAMINATION

WRITTEN EXAMINATION (Objective Type)	No. of Questions	Duration (Minutes)	Maximum Marks
Paper I : General Studies and General Abilities	150	150	150
Paper II: Concerned Subject	150	150	300
		Total Marks	**450**

Name of the Papers	Language Of Examination
PAPER I: General Studies and General Abilities	Bilingual i.e., English and Telugu
PAPER II: Concerned Subject	English Only

Syllabus

Paper-I: GENERAL STUDIES AND GENERAL ABILITIES

1. Current affairs – Regional, National and International.
2. International Relations and Events.
3. General Science; India's Achievements in Science and Technology.
4. Environmental issues; Disaster Management- Prevention and Mitigation Strategies.
5. Economic and Social Development of India and Telangana.
6. Physical, Social and Economic Geography of India.
7. Physical, Social and Economic Geography and Demography of Telangana.
8. Socio-economic, Political and Cultural History of Modern India with special emphasis on Indian National Movement.
9. Socio-economic, Political and Cultural History of Telangana with special emphasis on Telangana Statehood Movement and formation of Telangana state.
10. Indian Constitution; Indian Political System; Governance and Public Policy.
11. Social Exclusion; Rights issues such as Gender, Caste, Tribe, Disability etc. and inclusive policies.
12. Society, Culture, Heritage, Arts and Literature of Telangana.
13. Policies of Telangana State.
14. Logical Reasoning; Analytical Ability and Data Interpretation.
15. Basic English. (10^{th} Class Standard)

PAPER-II: CONCERNED SUBJECT

1. **ECOSYSTEMS:** Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity

2. **NATURAL RESOURCES: Classification of Resources:** Living and Non-Living resources, **water resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land**

resources: Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy sources

3. **BIODIVERSITY AND BIOTIC RESOURCES:** Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act

4. **ENGINEERING MATERIALS**: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials

5. **FLUID MECHANICS AND HYDRAULICS:** Newtonian and non-Newtonian fluids Fluid Properties; Measurement of Pressure - Manometers; Fluid Kinematics – Classification of Fluids, Stream function and Velocity potential, Fluid dynamics - Continuity equation, Bernoulli's equations and Impulse momentum equation; Laminar and Turbulent flow through pipes – significance of Reynolds number, Hagen – Poiseuille's equation, Darcy – Weisbach equation, Friction factor, head losses in pipes, bends and fittings; Dimensional analysis and similarity laws; elementary boundary layer theory

6. **PROCESS CALCULATIONS AND THERMODYNAMICS**: Laws of conservation of mass and energy; use of tie components; recycle, bypass and purge calculations; degrees of freedom, First & Second law of thermodynamics and their applications; equations of state and thermodynamic properties of real systems

7. **AIR, WATER, SOIL AND NOISE POLLUTION and CONTROL TECHNOLOGIES:** Classification of pollution, causes, effects and control technologies. **Air Pollution:** Primary and secondary pollutants, Particulate emission control, Control of SOx and NOx, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards, Wastewater Treatment methods: Primary, secondary and Tertiary, Grit chambers, sedimentation tank, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of waste water. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards

8. **SOLID AND INDUSTRIAL WASTE MANAGEMENT:** Municipal Solid Waste management, Collection, Segregation and Transport, Solid waste processing technologies, composition and characteristics of e-Waste and its management, Concepts of bioremediation

9. **GLOBAL ENVIRONMENTAL PROBLEMS, POLICIES AND LEGISLATIONS: C**limate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol and Paris convention, Indian Environmental Protection Act, Legal aspects Air Act, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules.

10. **ENVIRONMENTAL IMPACT ASSESSMENT TOWARDS SUSTAINABLE FUTURE:** EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP), Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.