Syllabus for *Written Test* for recruitment to the post of **Assistant Engineer (Agri-Irrigation)** in the West Bengal Services of Agricultural Engineers

CIVIL ENGINEERING

1. HYDROLOGY:

Hydrologic cycle: Measurement & analysis of rainfall; Factors affecting run-off: Methods of estimation of run-off; Different methods of measuring of velocity and discharge; Factors affecting infiltration; Infiltration indices. Measurement of infiltration capacity.

Occurrence and movement of ground water; Darcy's Law, Co-efficient of permeability. Types of wells, hydraulics of wells, construction and development of wells, Testing of wells.

2. SOIL AND WATER CONSERVATION:

Modern concept of conservation, conservation of ecological balance and environment, examples of renewable and non-renewable resources.

Mechanical composition of soils, analysis based on particle size distribution, causes and effects of soil erosion, erosion control measures.

Principles of watershed management.

3. WATER REQUIREMENTS:

Consumptive use - its measurement, Duty and Delta of water; Determination of canal capacity and storage requirement; Losses and efficiencies in irrigation; Measurement of evaporation.

4. IRRIGATION PRACTICES:

Land levelling and shaping; Types of Irrigation - Sub surface, surface and overhead.

Water logging - causes and remedial measures; Drainage of irrigated lands - surface and sub-surface.

5. IRRIGATION STRUCTURES:

Irrigation canals layout and design; Regulation structures, cross drainage works and canals outlets.

Principles of design of small hydraulic structures - surface flow and sub-surface flows. Design of small earth dams.

6. FLOODS & BANK PROTECTION:

Estimation of spillway design floods; principles of flood control; Stream bank erosion and its control.

7. BUILDINGS:

Kinds of building materials – their properties, timber brick work and R.C. construction, design of simple R.C.C. structures, Roof Trusses, Rural water supply and sanitation. Specification and Quantity Assurance and Control, Principles of Construction, planning and management, CPM & PERT.

8. PUMPS:

Pump characteristics and selection of pumps.

9. HYDRAULICS:

Fluid pressure and its measurement, hydrostatic forces on surface: flow through pipes; open channel flow, hydraulic jump; Measurement of discharge in pipes and open channels.