

## SCHEDULE-II

### PART 'A'

#### SYLLABUS FOR WRITTEN EXAMINATION FOR RECRUITMENT TO THE POST OF ASSISTANT ENGINEER (CIVIL) IN ARUNACHAL PRADESH PUBLIC WORKS DEPARTMENT, GOVERNMENT OF ARUNACHAL PRADESH.

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|----|----------------------------|------------------------|---------------------|
| 1. | Compulsory Paper           | (i) General English    | Maximum marks = 100 |
|    |                            | (ii) General Knowledge | Maximum marks = 100 |
| 2. | Technical Paper            | Civil Engineering      | Maximum marks = 200 |
| 3. | Interview/Personality test |                        | Maximum marks = 50  |

### SYLLABUS

#### GENERAL ENGLISH:

##### **Syllabus:-**

The questions will be designed to test their standard of English Grammar and Comprehension of language. The paper in English will consist of Comprehensive questions (Conventional essay type) including Objective type question carrying 1 to 15 marks of matriculation standard.

#### GENERAL KNOWLEDGE:

##### **Syllabus:-**

The General Knowledge will include current event and of such matters of every day observations and experiences in the area of scientific aspect as may be expected from a educated person who has not made an special study of any scientific subject. The paper will also include question of History of India and Geography of Nature which candidates should be able to answer without any special study. Certain questions will be based on analytical ability. The papers in General Knowledge will consist of Objective type questions only.

#### CIVIL ENGINEERING (SECTION-A)

1. Building materials and properties and strength of materials.
2. Building materials – Timers, stone, brick, lime tile, sand, surkhi, mortar and concrete, metal and glasses structural properties of metals and alloys used in engineering practice.

Stress and strains-Hook's Law-bending. Torsion and direct stresses. Elastic theory of bending of beams maximum and minimum stress due to eccentric leading. Bending moment and shear force diagram and defection of beams under static and live loads.

3. **Building construction and water supply and sanitary engineering.**

**Construction-** Brick and stone masonry walls, floors and roofs, staircases, carpentry in wooden floors, roofs ceiling, door and windows, finishes (plastering pointing painting and varnishing etc.)

**Soil mechanics** – Soils and their investigations,, Bearing capacities and foundation of buildings and structures-principles of design.

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**Building estimates** - Principle units of measurement taking out quantities for building and preparation of abstract of costs-specifications and data sheets for important items.

4. **Structural Engineering:**

**Steel structures:** Permissible stress, Design of beams simple and built-up columns and simple roof trusses and girders column bases and grillages for axially and eccentrically loaded columns - Belted, reverted and welded connections.

**RCC structures:** Specification of materials used proportioning workability and strength requirement ISI standards for design loads permissible stresses in RCC members subject to direct and bending stressed-design of simple supported overhanging and cantilever beams, rectangular and Tee beams in floors, roofs and lintels-axially loaded columns, their bases.

**CIVIL ENGINEERING SECTION-B**

1. **Water supply:** Sources of water, standards of purity, methods of unification, layout of distribution system, pumps and booster.

2. **Sanitation:** Sewers, storm water over flows, house drainage requirements appurtenances, septic tanks, amboff tanks, sewage treatment and dispersion trenches - Activated sludge process.

3. **Road and Bridges:**

**Survey and alignment** - Highway materials and their placements principles of design-width of foundation and payment, camber, gradient curves and super-elavation-retaining walls.

**Contruction:** Earth roads, stabilized and water bound macadam roads, bituminous surfaces and concrete roads, draining of roads.

**Bridges:** Types, economical spans, IRC loading designing superstructure of small span bridges-principles of designing foundation of abutments and piers of bridges, pile and well foundations.

Estimating earthwork for roads and canals:

This paper will consist of conventional questions and will be of a standard expected from a Bachelor of Engineering.

**GENERAL INSTRUCTION:**

1. All question papers must be answered in English, candidates may be permitted to use battery-operated calculators for the optional subject only.

2. Commission has discretion to fix qualifying marks in any or all the subject of the examination.



**SYLLABUS FOR WRITTEN EXAMINATION OF AGRICULTURAL ENGINEERING:**

1. Compulsory Paper	(i) General English	Maximum marks = 100
	(ii) General Knowledge	Maximum marks = 100
2. Technical Paper	Agricultural Engg.	Maximum marks = 200
3. Interview/Personality test		Maximum marks = 50

**SYLLABUS****GENERAL ENGLISH:****Syllabus:-**

The questions will be designed to test their standard of English Grammar and Comprehension of language. The paper in English will consist of Comprehensive questions (Conventional essay type) including Objective type question carrying 1 to 15 marks of matriculation standard.

**GENERAL KNOWLEDGE:****Syllabus:-**

The General Knowledge will include current event and of such matters of every day observations and experiences in the area of scientific aspect as may be expected from a educated person who has not made an special study of any scientific subject. The paper will also include question of History of India and Geography of Nature which candidates should be able to answer without any special study. Certain questions will be based on analytical ability. The papers in General Knowledge will consist of Objective type questions only.

**AGRICULTURAL ENGINEERING (SECTION-A)**

1. **Soil and water conservation:** Definition and scope of soil conservation; Mechanics and types of erosion, their causes Hydrologic cycle rainfall and run off-factors affecting them and their measurements; stream gauging-evaluation of run off from rainfall; Erosion control measure-biological and engineering.

**Basic open channel hydraulic:** Design of soil conservation structure-terraces, bunds, outlets and grassed waterways. Principles of flood control. Flood routing. Design of farm ponds and earth dams. Stream bank erosion and its control. Wind erosion and its control. Principles of watershed management. Investigation and planning in river valley projects.

2. **Irrigation and drainage:** Soil water-plant relationship, sources and types of irrigation. Planning and design of minor irrigation projects. Techniques of measuring soil moistures.

**Duty of water-consumptive use.** Water requirements of crops. Measurement and cost of irrigation water. Measuring devices. Flow through orifices, Weirs and flumes. Levelling and layout of irrigation systems. Design and construction of channels, Field channel, Pipelines, Head gates, Diversion boxes structures and road crossing, Occurrence of ground water, Hydraulics of wells, Types of wells, their construction, Drilling methods, Well development, Testing of wells.

**Drainage:** Definition causes of water logging. Methods of drainage. Drainage of irrigate lands. Design of surface and sub-surface systems.

3. **Building materials:** Kinds of building materials their properties- Timber, Brickworks and RC construction, Design of columns, Beams, roof trusses, Joints. Layout of a farm-stread. Design of farm houses, Animals shelters and storage structures. Rural water supply and sanitation.

#### **AGRICULTURAL ENGINEERING (SECTION-B)**

4. **Farm power and machinery:** Construction of different types of internal combustion engines. Ignition, fuel lubrication, cooling and governing systems of IC engines. Different types of tractors. Chassis transmission and steering. Farm machinery for primary and secondary tillage, seeding machinery for primary and secondary tillage, seeding machinery interculture tools and machinery. Plant protection equipment. Harvesting and threshing equipment. Machinery for land development. Pumps and pumping machinery.

5. **Electricity and Rural Electrification:** Power generation and transmission; Distribution of electricity for rural electrification.; A.C and D.C. circuits.

Uses of electric energy on the farm, Electric motors used in agriculture-types, selection, installation and maintenance.

#### **GENERAL INSTRUCTION:**

1. All question papers must be answered in English, Candidates may be permitted to use battery-operated calculators for the optional subject only.
2. Commission has discretion to fix qualifying marks in any or all the subject of the examination.