SYLLABUS FOR DIRECT RECRUITMENT OF SR. INSTRUCTOR ITI, (ENGINEERING TRADE), GROUP-'C', NON-GAZETTED UNDER THE DEPARTMENT OF INDUSTRIES AND COMMERCE, GOVT. OF TRIPURA

The Examination will comprise of Two successive stages viz. (i) Written Examination (Multiple Choice Type Test) carrying 170 marks and (ii) An Interview cum Personality Test carrying 30 marks.

(A) Scheme of the Written Examination: The Written Examination will consist of one paper viz. a paper on "General Studies and "Engineering Aptitude". The paper will be of an Objective Type consisting of 170 Multiple- Choice Question. The paper will carry 170 marks and will be of Two and a half (2½) hours duration. The paper consist of Two Parts, namely 1) Part-A General Studies (50 questions of 01 marks each) ii) Part-B "Engineering Aptitude" (120 questions of 01 marks each). There will be Negative marks for MCQ. For each question for which a wrong answer has been given by the candidate, **one-fourth** of the marks assigned to that question will be deducted as penalty.

(B) Details Syllabus for the written Examination:

PART-A: GENERAL STUDIES
(COMPULSORY FOR ALL ENGINEERING GROUP)

English Composition:- English Composition will cover Synonyms, Antonyms, Use of Common Phrase & Idioms, Use of appropriate Preposition & Articles, Spotting Errors etc.

General knowledge : Question will include knowledge of Indian History , Geography & Constitution of India of such a nature which the candidate shall able to answer without any special study. Question on Tripura and North Eastern States, its historian Topography will also be included.

Knowledge of Current Affairs :-Question will include the knowledge of current events of Local, National & International important and of such matters of everyday observation and experiences in their scientific aspect as may be expected of an educated person who has not made a special study of any scientific subjects.

Numerical Ability:- Question on Numerical Ability will be similar to that of the compulsory Mathematics based on 10th standard.

General Mental Ability:-Question will be set on logical perception, understanding and natural conclusion etc.

PART-B: ENGINEERING APTITUDE
SYLLABUS OF SR. INSTRUCTOR(CIVIL)

1. BUILDING MATERIALS

Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength. Cement: Compounds of, different types, setting times, strength. Cement Mortar: Ingredients, proportions, water demand, mortars for plastering and masonry. Concrete: Importance of W/C Ratio, Strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive testing, mix design methods.

2. STRENGTH OF MATERIAL

Bending moment & share force in beams , Bending stress in beams ,Shearing stresses in beams Columns & struts , Combined bending & direct stress , Compound & complex stress , Strain energy & impact loading.

3. THEORY OF STRUCTURE

Definitions & general principles , Primary stress analysis for statically determinate pin jointed structures , Fixed & continuous beams, propped cantilever moment distribution method ,Retaining walls (earth retaining structures)

4. THEORY OF CONCRETE AND MASONRY STRUCTURES

Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members. Principles of prestressed concrete design, materials, methods of prestressing, losses. Design of simple members and determinate structures. Introductions to prestressing of indeterminate structures.
Design of brick masonry as per I.S. Codes.

5. SOIL MECHANICS

Properties of soils, classification and interrelationship; Compaction behavior, methods of compaction and their choice; Permeability and seepage, flow nets, Inverted filters; Compressibility and consolidation; Shearing resistance, stresses and failure; soil testing in laboratory and in-situ; Stress path and applications; Earth pressure theories, stress distribution in soil; soil exploration, samplers, load tests, penetration tests.

6.FOUNDATION ENGINEERING

Types of foundations, Selection criteria, bearing capacity, settlement, laboratory and field tests; Types of piles and their design and layout, Foundations on expansive soils, swelling and its prevention, foundation on swelling soils.

7. SURVEYING

Classification of surveys, scales, accuracy; Measurement of distances - direct and indirect methods; optical and electronic devices; Measurement of directions, prismatic compass, local attraction; Theodolites - types; Measurement of elevations - Spirit and trigonometric leveling; Relief representation; Contours; Digital elevation modeling concept; Establishment of control by triangulations and traversing - measurements and adjustment of observations, computation of coordinates; Field astronomy, Concept of global positioning system; Map preparation by plane tabling and by photogrammetry; Remote sensing concepts, map substitutes.

8. TRANSPORTATION ENGINEERING

Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation; Materials and construction methods for different surfaces and maintenance: Principles of pavement design; Drainage.