

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI

1	Name of Syllabus	C.C. in CIVIL SUPERVISION (304208)																																																													
2	Max. No's of Student	25 students																																																													
3	Duration	1 YEAR																																																													
4	Type	Full Time																																																													
5	No Of Days / Week	6 Days																																																													
6	No Of Hours /Days	7 Hrs																																																													
7	Space Required	Lab = 1000 Sq feet Class Room = 200 Sq feet TOTAL = 1200 Sq feet																																																													
8	Entry Qualification	S.S.C.																																																													
9	Objective Of Syllabus/ introduction	Earth work and foundation ,Brick masonry ,Stone masonry RCC structure,Pre-fabrication construction elements Hollow blocks, Steel and timber structures, Joinery and finishing Anti termite treatment , Pre stressing techniques , Installation of public health fittings																																																													
10	Employment Opportunity	a) Wage Employment : Wage employment in public sector /private construction companies/Boards/Corporation/Departments Wage employment in service sector as CAD Operator Architect Offices organizations Hotels and Hospitals Wage employment in military engineering services/banks/municipal corporations & Committees/Panchayati Raj etc. b) Self Employment Public Health, plumbing and water supply installation contracts Aluminum and other partition jobs Preparation of municipal drawings Estimating and costing jobs Surveyor/loss assessment/valuation of buildings etc																																																													
11	Teacher's Qualification	Diploma or Degree in Civil Engineering.																																																													
12	Training System	Training System Per Week <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>18 Hours</td><td>24 Hours</td><td>42 Hours</td></tr></table>						Theory	Practical	Total	18 Hours	24 Hours	42 Hours																																																		
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13	Exam. System	<table><tr><td>Sr. No.</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Mini. Marks</td></tr><tr><td>1</td><td>30420811</td><td>CONSTRUCTION MATERIALS & DRAWING</td><td>TH-I</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30420812</td><td>CIVIL SUPERVISOR & CONSTRUCTION</td><td>TH-II</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>3</td><td>30420813</td><td>SURVEYING & ESTIMATING</td><td>TH-III</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>4</td><td>30420821</td><td>CONSTRUCTION MATERIALS & DRAWING</td><td>PR-I</td><td>3 hrs.</td><td>100</td><td>50</td></tr><tr><td>5</td><td>30420822</td><td>CIVIL SUPERVISOR & CONSTRUCTION</td><td>PR-II</td><td>3 hrs.</td><td>100</td><td>50</td></tr><tr><td>6</td><td>30420823</td><td>SURVEYING & ESTIMATING</td><td>PR-III</td><td>3 hrs.</td><td>100</td><td>50</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>600</td><td>255</td></tr></table>						Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Mini. Marks	1	30420811	CONSTRUCTION MATERIALS & DRAWING	TH-I	3 hrs.	100	35	2	30420812	CIVIL SUPERVISOR & CONSTRUCTION	TH-II	3 hrs.	100	35	3	30420813	SURVEYING & ESTIMATING	TH-III	3 hrs.	100	35	4	30420821	CONSTRUCTION MATERIALS & DRAWING	PR-I	3 hrs.	100	50	5	30420822	CIVIL SUPERVISOR & CONSTRUCTION	PR-II	3 hrs.	100	50	6	30420823	SURVEYING & ESTIMATING	PR-III	3 hrs.	100	50						600	255
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4	30420821	CONSTRUCTION MATERIALS & DRAWING	PR-I	3 hrs.	100	50																																																									
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CONSTRUCTION MATERIALS & DRAWING
THEORY I
PART A
CONSTRUCTION MATERIALS

CONTENTS

- 1 CEMENT**
 - 1.1 Ingredients of cement
 - 1.2 Manufacture of cement
 - 1.3 Various Types of cement & uses
 - 1.4 Effect of cement on properties of concrete
 - 1.5 Storing of cement
 - 1.6 Field tests of cement
 - 1.7 Laboratory tests for cement
- 2 STONE AND COARSE AGGREGATE**
 - 2.1 Types of rocks
 - 2.2 Dressing of stone
 - 2.3 Qualities of good stone
 - 2.4 Used stones in Building
 - 2.5 Study of crushers for obtaining coarse Aggregate
 - 2.6 Common size of coarse Aggregate used in concrete
- 3 BRICK**
 - 3.1 Uses of bricks, composition of good brick earth
 - 3.2 Size and quality of good brick
 - 3.3 Testing of brick, terms
 - 3.4 Manufacturing of brick
 - 3.5 Types of bricks
- 4 CONCRETE**
 - 4.1 Meaning – Types of concrete and uses
 - 4.2 Procedure for preparing concrete
 - 4.3 Transporting of concrete precautions in transporting
 - 4.4 Quality of good concrete
 - 4.5 Necessity of curing, Method of curing
 - 4.6 Work ability
 - 4.7 Laying of concrete and precautions
 - 4.8 Admixtures used in concrete and properties of such concrete
 - 4.9 Ready mix concrete
- 5 TIMBER**
 - 5.1 Types of Timber
 - 5.2 Section of timber
 - 5.3 Seasoning of timber
 - 5.4 Defects in timber
 - 5.5 Preservation of timber
 - 5.6 Characteristics of good timber
 - 5.7 Timber based product
- 6 MORTAR**
 - 6.1 Types of mortar
 - 6.2 Uses and applications
 - 6.3 Various proportion of cement mortar
 - 6.4 Quality of good mortar
- 7 STEEL**
 - 7.1 Types of steel used in R.C.C.
 - 7.2 Various ferrous and non – ferrous metals
 - 7.3 Designation of steel as per ISI

- 8 **TILES**
 - 8.1 Types of tiles
 - 8.2 Cutting of tiles
 - 8.3 Different types of tiles used
- 9 **BUILDING FINISHING MATERIALS**
 - 9.1 Different types of paints
 - 9.2 Varnishes
 - 9.3 Polish
 - 9.4 Hard wares
 - 9.5 Characteristics of good paint
 - 9.6 Units of measurements
 - 9.7 Units of purchase
- 10 **MISCELLANEOUS MATERIALS**
 - 10.1 Cleaning material
 - 10.2 Glass
 - 10.3 Damp – proofing material
 - 10.4 Plastic
 - 10.5 Adhesives
 - 10.6 Earthenware and stone ware
 - 10.7 Commercial names and units of purchase

**THEORY I
PART B
DRAWING**

CONTENTS

- 1 **INTRODUCTION**
 - 1.1 Introduction
 - 1.2 Importance of Engineering Drawing
 - 1.3 Drawing Instruments, Equipments and Materials
 - 1.4 Lettering Technique
 - 1.5 Lines Lettering and Dimensioning
 - 1.6 Types of Lettering
 - 1.7 Different scales used in Drawing
- 2 **GENERAL CIVIL CONVENTIONS**
 - 2.1 Meaning of F.S.I., Built up area, Carpet area
 - 2.2 Rules for selecting different types of room and their size and floor heights
- 3 **DOORS AND WINDOW**
 - 3.1 Types of Door
 - 3.2 Types of window
 - 3.3 Scaled Drawing of various Door
 - 3.4 Scaled Drawing of Various window
 - 3.5 Fixtures and fastening for window
 - 3.6 Fixture for door
- 4 **SYMBOLS**
 - 4.1 Construction symbols
 - 4.2 Plumbing and sanitary symbols
 - 4.3 Electrical symbols
- 5 **PLUMBING**
 - 5.1 Plumbing accessories
 - 5.2 Types of accessories
 - 5.3 Layout for sanitary work

- 6 **R.C.C.**
 - 6.1 Different Types of stair
 - 6.2 Structural steel work
 - 6.3 Roof Truss
 - 6.4 Drawing of slabs (one way and two way)
 - 6.5 Beams
 - 6.6 Column
 - 6.7 R.C.C. Foundations
 - 6.8 Bar bending schedule
- 7 **FREE HAND SKETCHING**
 - 7.1 Definition
 - 7.2 Necessity
 - 7.3 Practice in free hand sketching of various object
- 8 **PERSPECTIVE**
 - 8.1 Perspective views
 - 8.2 Definitions of perspective
 - 8.3 Elements
 - 8.4 Station point
 - 8.5 Picture plane
 - 8.6 Methods of perspective projections
- 9 **BUILDING BY LAWS AND STANDARD NORMS**
 - 9.1 Definition of Marginal Distance and their necessity,
Normal Marginal Distances provided for Residential Building
 - 9.2 Minimum Dimensions of Living Room, Bed Room,
Master bed Room, W.C. Bath, Toilet
 - 9.3 Permissible Built up area for Residential Building,
Public Building

CONSTRUCTION MATERIALS & DRAWING

PRACTICAL - I

PART A

CONSTRUCTION MATERIALS

SR.NO.	PRACTICALS NAME
1	Field Test of cement
2	Determining initial and final setting time of cement
3	Determining fineness Modulus of cement
4	Determination of compressive strength of cement
5	Market survey for stone, aggregate, sand etc
6	Visit to Quarry
7	Compressive strength of stone
8	Abrasion Test of Metal
9	Market survey for cement
10	Field Test of Brick
11	Compressive Test of Brick
12	Water absorption of Brick
13	Market survey for Various types of brick
14	Compressive Test of concrete cube Test
15	Slump Test
16	Compaction factor Test
17	Visit to a Timber Factory
18	Preparation of cement Mortar
19	Bending Test of tiles
20	Tensile Test of mild steel bar
21	Abbreviation test of tile
22	Market survey for Steel of various types and Diameter, Binding wire
23	Market survey for Adhesive material
24	Market survey for flooring, roofing and wall tiles
25	Market survey for cleaning materials
26	Market survey for white washing
27	Market survey for Varnish and polishing materials
28	Market survey for cement product like tank, pipe etc
29	Market survey for Various types of timber
30	Market survey for Plywood, sunmica, formica etc.
31	Market survey for building Hard ware
32	Market survey for earthenware and stone ware products
33	Market survey for paints
34	Market survey for Plastic, P.V.C. products
35	Market survey for D.P.C. and water proofing material
36	Market survey for types of glasses

DRAWING
PRACTICAL I
PART B

SR.NO	CONTENTS	NO.OF SHEETS
1	Lines, Lettering, Dimensioning	2
2	Plain Scales and Isometric Scales	1
3	General Conventions	1
4	Door and Window	2
5	Different Fixtures and Faster	2
6	Symbols	1
7	Plumbing – Types of accessories	2
8	Different stairs	2
9	Different R.C.C. work	2
10	Free hand sketching	1
11	Perspective drawing 2 point simple – object – 2 sheet other two point, Perspective of Building	4
12	Visit to P.W.D.0office and Site	
13	Visit to Municipal civil office	

**CIVIL SUPERVISOR & CONSTRUCTION
THEORY - II
PART A
CONSTRUCTION**

CONTENTS

- 1 FOUNDATION**
 - 1.1 Necessity and purpose of foundation
 - 1.2 Types of foundation
 - 1.3 Footing for load Bearing structure
 - 1.4 Column footing and combined footing
 - 1.5 Pre cast concrete piles
 - 1.6 Under reamed piles
 - 1.7 Clearing of site
 - 1.8 Line out**
- 2 EXCAVATION**
 - 2.1 Manual method of Excavation
 - 2.2 Machine method of Excavation
 - 2.3 Machines used for Excavation
 - 2.4 Disposal of Excavated Material
 - 2.5 Meaning of Term lift and lead
 - 2.6 Dewatering of trench
 - 2.7 Building
 - 2.8 Pumping single stage
 - 2.9 Shoring and strutting of Trench**
- 3 PLAIN CEMENT CONCRETE**
 - 3.1 In gradients of concrete**
 - 3.2 Different proportions of concrete and where used
 - 3.3 Procedure of preparing concrete, Manual and Machine mixing
 - 3.4 Admixtures used in concrete ready mix concrete
- 4 STONE MASORY**
 - 4.1 Types of stone used in construction of stone masonry
 - 4.2 How stone is obtained
 - 4.3 Preparations of cements mortar various proportions
 - 4.4 Terms used in stone masonry
 - 4.5 Procedure of constructing un coursed Rubble masonry purpose of through stone construction
 - 4.6 Point to be observed while construction stone masonry
- 5 BRICK MASONRY**
 - 5.1 Terms used in Brick masonry
 - 5.2 Types of Brick
 - 5.3 Construction of Brick masonry
 - 5.4 Types of Brick Bond
 - 5.5 Brief information of siporex block masonry
 - 5.6 Hollow and solid concrete block masonry
- 6 SCAFFOLDING**
 - 6.1 Purpose and Necessity of scaffolding
 - 6.2 Single and Double scaffolding name of parts setting up members of scaffolding
 - 6.3 Materials used in construction of scaffolding

- 7 REINFORCED CEMENT CONCRETE**
- 7.1 Different proportions of R.C.C. and where used
 - 7.2 In gradients of R.C.C. concrete
 - 7.3 Meaning of Batching and method i.e. volumetric method and weight batching method
 - 7.4 Procedure of preparing concrete
 - 7.5 Reinforcing steel used in R.C.C. members
 - 7.6 Expansion joints, Material used and procedure of construction of Expansion, purpose, providing Expansion joint.
- 8 POINTING AND PLASTERING**
- 8.1 Material for pointing
 - 8.2 Procedure of pointing, Pre – construction, preparation, procedure and post construction, pre – construction
 - 8.3 Necessity of pointing and plastering
 - 8.4 Types of pointing
 - 8.5 Material for plastering
 - 8.6 Types of plaster internal and External wall plaster
 - 8.7 Procedure of plastering for each type
- 9 PAINTING**
- 9.1 White washing to walls and ceiling, Material Procedure for new and old surface
 - 9.2 Dry Distemper to walls, Material procedure for new and old surface
 - 9.3 Oil Bound Distemper and Emulsion, Material procedure for new and old surface
 - 9.4 Cement paint to External wall, Material procedure for new and old surface
 - 9.5 Oil paint primer coat. Types of paint, Thinner, procedure of applying oil paint to wood work steel work and walls.
- 10 STAIR**
- 10.1 Terms used in stair
 - 10.2 Classification of stair based on shape and material
 - 10.3 Requirements of good stairs
 - 10.4 Thumb Rules for design of stair
 - 10.5 Design of Dog legged stair
 - 10.6 Types of R.C.C. stair
 - 10.7 Frame work for stair
 - 10.8 R.C.C. circular stair
 - 10.9 Finishing to Tread of step
 - 10.10 Finishing of Rise
 - 10.11 Hand Rails Types and Fixing Procedure

CIVIL SUPERVISOR & CONSTRUCTION
PART B
THEORY - II

CONTENTS

- 1 **STONE MASONRY**
Brief information of stone masonry
- 2 **BRICK MASONRY**
Brief information of brick masonry
- 3 **ROOF**
 - 3.1 Types of Roof
 - 3.2 Purpose of Roof
 - 3.3 Pitched Roof
 - 3.4 Technical Terms
 - 3.5 Lean to Roof
 - 3.6 King post and Queen post Truss
 - 3.7 Roof coverage necessity and purpose
 - 3.8 Types of Roof Covering
 - 3.9 Flat roof only R.C.C. slab
- 4 **FLOORING**
 - 4.1 Flooring at plinth level, plinth filling sand floor finish
 - 4.2 Types of flooring
 - 4.3 Procedure of fixing tiles – Marble, Mosaic, Ceramic
 - 4.4 Procedure for fixing P.V.C. tiles
 - 4.5 Dado – Function, materials used and procedure for fixing
- 5 **DOOR AND WINDOW**
 - 5.1 Function of Door and Window
 - 5.2 Function of Window, Rules for window
 - 5.3 Types of Door shutters
 - 5.1 Parts of a Door and Window
 - 5.2 Wooden and steel Door and Window frame
 - 5.3 Fixture for Door
 - 5.4 Types of window shutters
 - 5.5 Lowered window
 - 5.6 Steel Window
 - 5.7 Aluminum sliding windows
 - 5.8 Fixtures and Fastening for windows
 - 5.9 Grills for window
- 6 **LINTELS**
 - 6.1 Necessity of lintels
 - 6.2 R.C.C. lintels
 - 6.3 Sills – Types of sills constructing
- 7 **WATER PROOFING**
 - 7.1 Function and Necessity
 - 7.2 Types of Water proofing
 - 7.3 Water proof Compounds use concrete and plaster
- 8 **TERMITE PROOFING**
 - 8.1 Necessity of Termite Proofing
 - 8.2 Types of Termite Proofing
 - 8.3 Selection Method of Termite Proofing to be used
 - 8.4 Procedure of Termite Proofing

- 9 **PLUMBING AND SANITARY WARE**
- 9.1 G.I. pipes and class of pipes and diameter, where used
 - 9.2 Fixtures – Elbow, Tee, Nipple, Reducer, Enlarge bend, Plug, Union Nuts etc.
 - 9.3 Wash basin, Type, fixing, Arrangement
 - 9.4 W.C. pan type. Fixing, Arrangement
 - 9.5 European type W.C., Gully trap, where used
 - 9.6 Sanitary pipes
 - 9.7 A.C. and C.I. and P.V.C. pipes, pipe from W.C. bath Kitchen, procedure of fixing
 - 9.8 Rain Water down take pipes
 - 9.9 Inspection chamber
 - 9.10 Intercepting sewer trap where used and importance

**CIVIL SUPERVISOR & CONSTRUCTION
PRACTICAL - II
PART A
CONSTRUCTION**

	CONTENTS
1	FOUNDATION 1.1 Line out of 3 to 4 Room load Bearing Building 1.2 Line Out of framed structure
2	EXCAVATION 2.1 Visit to Excavation site
3	PLAIN CEMENT CONCRETE 3.1 Visit to site showing and process of mixing transportation, laying and Curing
4	STONE MASONRY 4.1 Construction of U.C.R. stone masonry in foundation construction UCR Stone masonry for compound wall (ht 1.5 to 1.8 m) 4.2 Study of various types of stone masonry by observation
5	BRICK MASONRY 5.1 Setting of bricks for spread foundation 5.2 Construction of structure bond for straight wall (Dry brick) 5.3 Construction of structure bond for corner wall 5.4 Construction of Header bond for straight wall 5.5 Construction of Header bond for corner wall 5.6 Construction of English bond for one and one half brick straight wall 5.7 Construction of Brick pillar detached 5.8 Construction of Brick pillar attached to wall
6	Scaffolding Single Scaffolding up to G + 1 floor Double Scaffolding up to G + 1 floor
7	REINFORCED CEMENT CONCRETE 7.1 Visit to site to see In gradients and desired quality of material 7.2 Method of mixing 7.3 Draw figures – column footing, column, beam, slab, lintel, showing Reinforcement 7.4 Actually carry out preparing standard hook and EL 7.5 Preparing of stirrups of 6 mm bar for column and beam.
8	POINTING AND PASTERING 8.1 Visit to site for seeing procedure for different types of plaster 8.2 Actual plaster for wall 3m *3m Internal and External wall

9	PAINTING 9.1 Actual painting of surface 9.2 White wash 3m * 3m surface area 9.3 Dry Distemper 3m * 3m surface area 9.4 Oil Bound 3m * 3m surface area 9.5 Cement paint 9.6 Oil paint
10	STAIR 10.1 Design R.C.C. Dog – legged stair draw its plan and sectional Elevation 10.2 Visit site see various type of stair 10.3 Sketches of types of stair

**CIVIL SUPERVISOR & CONSTRUCTION
PRACTICAL - II
PART B**

SR.NO.	CONTENTS
1	Construction of UCR stone masonry
2	Construction BBM in super structures in English / Flemish
3	Construction on concrete block masonry in superstructure
4	Draw sketch of couple roof
5	Draw sketch of King post, Queen for Truss
6	Line Diagrams of steel Trusses
7	Joint of steel Truss for king post Truss
8	Fixing of Tiles for pavement
9	Fixing of Tiles in as 3m * 3m
10	Fixing of Tiles for Dado
11	Scaled drawing of fully paneled
12	Scaled drawing of fully glazed window
13	Visit to see Types of door and windows
14	Sketches of commonly used fixture for door and window fixture commonly used
15	Draw sketch of lintel
16	Brick bat cab for 3m * 3m
17	Different procedure of Termite proofing
18	Different types of pipe and fixtures
19	Market survey for pipe fitting and sanitary work
20	Threading and jointing of G.I. pipe
21	Jointing and fixing of C.I. sanitary pipes
22	Construction of Inspection Chamber

SURVEYING & ESTIMATING
SURVEYING
THEORY - III
PART A
Sr.No. Major Topics

1. Introduction
2. Chain Surveying
3. Compass Surveying
4. Plane Table Surveying
6. Theodolite Surveying

DETAILED SYLLABUS

1. Introduction :

Concept of surveying - purpose of surveying - linear and angular measurements - classification of surveying. Plane and geodetic surveying classification based on instruments, engineering surveys - Reconnaissance, preliminary location survey, final location survey.

2. Chain Surveying

- Purpose and principle of chain survey - equipments and their function , Conventional signs.
- Errors in chaining
- Types of survey lines - check line-fixing of survey stations - types of survey stations
- Different operations in chain surveying - chaining on sloped ground. Principles used in chain Triangulation.
- Recording field notes - field book
- Obstacles in chain surveying.
- Calculation of Areas - Average Ordinate, Simpson, Trapezoidal methods.
- Measurement of Volume from cross sections, Spot Levels and Contours.

3. Compass Surveying

- Purpose and Principle of compass survey - description, use and working of prismatic compass.
- Concept of true meridian - magnetic meridian - Arbitrary meridian.
- Bearing - Representation of Bearing - WCB - Quadrantal Bearing. Conversion of whole circle bearing to quadrantal bearing.
- Compass traversing in field.
- Local attraction - detecting and correcting bearings
- Errors in compass surveying - natural and instrumental.

4. Plane Table Surveying

- Principle and purpose of plane table surveying, accessories used in plane table surveying - their uses.
- Methods of plane table - Radiation, Traversing, Intersection.

5. Theodolite Surveying

Principles of Theodolite Surveying - component parts, technical terms - temporary adjustments
Measurement of Horizontal angles, vertical angles
Determination of heights and distances.

**ESTIMATION
THEORY III
PART B**

1. Introduction
2. Measurement of materials and works
3. Types of Estimates
4. Detailed and abstract estimate of buildings by different methods
5. Analysis of Rates and Specifications
6. Estimation of quantities of steel & RC.C. elements
7. Detailed estimates of
 1. Load bearing building
 2. G + 2 Framed structure building
 3. Septic tank

DETAILED SYLLABUS:

1. Introduction

- Definition of Estimation and costing Need for Estimation and costing

2. Measurement of materials and works

- Units of measurement for various items of civil engineering works
- Rules for measurement
- Different methods of taking out quantities - Centre line method - Long and short walls method

3. Types of Estimates

- Detailed Estimate - Definition - Stages of preparation - details of measurement and calculation of quantities and abstract of estimated cost
- Preliminary or approximate estimate - plinth area estimate - cubic rate estimate - estimate per unit base
- Problems in preliminary estimate

4. Detailed and abstract estimate of buildings by different methods

- Single roomed building (Load bearing type structure)
- Two roomed building (Load bearing type structure)
- Single storeyed Residential building with number of rooms (Load bearing type structure)
- Single storeyed Residential building (Framed Structure type)
- Primary School building with sloped roof
- g) Detailed estimate of compound wall and steps.

5. Analysis of Rates and Specifications

- Specifications for different items of work
- Cost of Labour - Types of labour - Standard Schedule of rates
- Lead and Lift - Leads Statement
- Preparation of Unit rates for finished items of works
- Cement Concrete in foundation
- R.C.C. Works
- Brick masonry in cement mortar

- C.R.S. masonry in cement mortar
 - Plastering in cement mortar
 - Pointing in cement mortar
 - Cement concrete flooring
 - Doors and windows - panelled and glazed
- 6. Estimation of quantities of steel of R.C.C. elements**
- R.C.C. beam
 - R.C.C. Lintel
 - R.C.C. Slab
 - R.C.C. Column footing
- 7. Detailed estimates**
- Gravel Road
 - Cement Concrete Road
 - Septic tank with Soakpit

SURVEYING PRACTICAL III PART A

Sl.No.	Topics
1.	Chain Surveying
2.	Compass surveying
3.	Plane table surveying
4.	Levelling
5.	Theodolite surveying
6.	Plotting

DETAILED SYLLABUS :

1.0. Chain Surveying

Familiarity with instruments used in chain surveying

Practicing unfolding and folding of chain

Ranging and chaining of lines with offsets to objects and recording in field book

Chain triangulation around a building covering a small area with other details, taking offsets and recording in the field book.

To prepare a layout of the given area covering buildings roads etc

2.0. Compass Surveying

Familiarity with Instruments used in compass surveying -prismatic compass

Setting up the compass - observation of bearings

Traversing with prismatic compass and chain - calculation of included angles and check.

Traversing with prismatic compass and chain - closed traverse covering the given area and recording

3.0. Plane Table Surveying

Introduction to plane table equipments and accessories

Setting of the plane table and plotting a few objects (points) by radiation method

Traversing an area by plane table

4.0. Leveling

Study of dumpy level, leveling staff

Temporary adjustments of dumpy level

Taking out levels of various points and booking in a level field book

5.0. Theodolite Surveying

Study of Theodolite

Measure of Horizontal angle between given lines

Measurement of vertical angle

6.0. Plotting

Conventional signs in surveying

Perpendicular and oblique offsets

Plotting of land survey - chain and cross staff surveying - calculation of areas

ESTIMATION PRACTICAL - III PART B

1. Units of measurements and payments
2. Calculation of materials
3. Analysis of rates
4. Preparation of detailed estimate
5. Preparation of tender notice
6. Preparation of contracts
7. Taking out quantity for septic tank
8. Preparation of specifications
9. Estimate of door and window

DETAILED SYLLABUS :

1. Units of measurements and payments

Units of measurements and payments for different items of works.

2. Calculation of materials

P.C.C. concrete of different proportions.

Brick masonry.

Stone masonry

Plastering work

Pointing work

R.C.C. Slab

Painting work

3. Analysis of rates

Earthwork in excavation

Cement concrete in foundation

R.C.C. roof slab

Brick masonry in cement mortar

Stone masonry in cement mortar

Cement plastering

- Cement pointing
- White washing
- Painting on woodwork
- Cement concrete floor
- Oil painting
- 4. Preparation of detailed estimate :**
For residential building.
- 5. Preparation of Tender notice**
Points included in tender notice.
Preparation of tender notice
- 6. Preparation of contracts**
Contract – definition.
Types of contract and their preparation.
- 7. Taking out quantity for septic tank**
- 8. Preparation of specifications**
Foundation
Roof
Floor
R.C.C. slab
Painting
Plastering
Pointing
Brick work
Stonework
- 9. Estimate of door and window**
Preparation of estimate for fully paneled door and fully paneled window

List of Reference Books

Sr. No.	Author	Book	Publications
01.	Sandeep Mantri	The A to Z of Practical Building Construction and Its Management	Staya Prakashan, New Delhi
02.	Sushil Kumar	Building Construction	
03.	Ahuja Birdi	Fundamentals of Building Construction	
04.	Rangwala	A Text Book of Building Construction	
05.	Philbin	Basic Plumbing	Prentice Hall
06.	Inness J. H.	Teach yourself plumbing	The English University press Ltd.
07.	Rules and Regulations by laws of Corporation/ municipal Corporation		

08.	I.S. Code for Materials and Building work		
09.	Schedule Of Rates – B and C		
10.	Specification Rate book – B and C		
11.	Chaudhari – Building Material		
12.	Dutta B.N. – A Text Book of Estimating and Costing		
13.	Ithart M – Teach yourself House Repairs		
14.	Vastu shilpa yojna va Abhikalpana (Marathi)	Maharashtra Vidyapith	Grantha Nirmal Mandal – Nagpur
15.	Surveying and Levelling (Vol I)	T. P. Kulkarni and S.V. Kulkarni	
16.	Parbat Singh	Lini Engineering Materials	
17.	B.C.Punmia	Building Costruction	
18.	N.D.Bhatt and V.M. Panchal	Engineering Drawing	Charotar Publications, Anand
19.	M.Y.Subnis	Cement concrete mix design	Vipu Publications, Bombay
20.	R.S.Malik, G.S.Deo	Civil Engineering Drawing	
21.	W.B.mckay	Building Construction Volume – 1, 2, 3, 4	Orient Longman
22.	B.Shri Kapare	Concrete – Ek Tantra (Marathi)	
23.	Dhabale / Patwardhan	Bandhkamacha Onama (Marathi)	
24.	B.D.Erande	Bandhkam Andazpatrak shastra (Marathi)	
25.	Shah, Kale, Patki	Building Drawing	
26.	B.S.Patil	Civil Engineering Contracts	Orient Longman
27.	Vazrani, Chandola	Construction Management	
28.	Harpal Singh	Construction Management	
29.	B.C.Gupta	Construction Management and Accounts	Standard Publishers
30.	Hajra Choudhari	Elements of Workshop Technology Part I	

List of Tools and Equipments

Sr. NO.	Name	Qty.
01.	Sensitive Balance with weights	1 Set
02.	Ventilated Oven	1
03.	Slump Cone	1
04.	90 micron sieve	1
05.	Sand sieves	1
06.	Needle Vibrator	1 each
07.	Screened Vibrator	1
08.	Vicat's Apparatus	1
09.	Drilling machine	1
10.	Tile cutting machine	1
11.	Mini mixer (1/2 cement bag)	1
12.	Over Head projector with screen	1
13.	Bar Bending table	1 Set
14.	Different size of Trays	1 Set
15.	Carpenatry Vice	2
16.	G cramp	1
17.	Batching Box	2
18.	Dumpy level with staff	1
19.	Cross staff survey set	2
20.	Prismatic compass with stand	1
21.	Steel Tapes – 3m , 5m , 10m	5 Each
22.	Metallic tape – 15m , 30 m	2 Each
23.	Scale – 1 m	1
24.	Trowels	10
25.	Steel Buckets	5
26.	Iron pans	5
27.	Rammer	1
28.	Linedori Bundles	2
29.	Plumb bob	5
30.	Spirit level	5
31.	Tube level	5
32.	Spade	2
33.	Measuring Cylinder	2
34.	Pickaxe	2
35.	L square	5
36.	Scabbling hammer	2
37.	Claw hammer	2
38.	Sledge hammer	2
39.	Ball peen hammer	2
40.	Cross peen hammer	2
41.	Wooden Mallets	2
42.	Punch, point and Gauge	1 Set
43.	Spanner set	1
44.	Screw Drivers	5
45.	Aluminium Float	2
46.	Wooden Float	2
47.	Spong	2
48.	Plastering Drum machine	1
49.	Metal float	2
50.	Corner float	2
51.	Corner float	3 Each

52.	Painting Brush – 1” , 2” , 3” , 4” , 6”	2
53.	Scrapping Tool	1
54.	Spray Gun	1
55.	Palti Patra	5
56.	Ratchet Brace	1
57.	Bradawal	1
58.	Gimlet	2
59.	Hand saw	2
60.	Compass saw	2
61.	Mortise chisel	2
62.	Firmer chisel	2
63.	Jack plane	5
64.	Plier	2
65.	Oil stone	2
66.	Saw setting plier	1
67.	Glass cutter	2
68.	Augar	2
69.	Marking Gauge	2
70.	Channi , Katawani	2
71.	Various dags for bar bending – 6mm , 8 mm , 10 mm , 12 mm	2 Sets
72.	Pipe vice	2
73.	Pipe Die set – ½” , 1”	1
74.	Tap wrench	1
75.	Pipe wrench	2
76.	Tennon saw	2
77.	Pincers	2
78.	Try squares	5
79.	Compass	2
