

**UNIT I****Chapter 1 : Fundamentals of Estimating and Costing****1-1 to 1-17**

Syllabus : Estimating and Costing : Meaning, purpose, Administrative Approval, Technical Sanction and Budget provision. Types of estimates : Approximate estimate and detailed estimate. Detailed Estimate : of New work. Types and Uses of Estimates : Revised estimate, supplementary estimate, revised, and supplementary estimate, repair and maintenance estimate, renovation Estimate. Roles and responsibility of Estimator. Checklist of items of work in load bearing and framed structure as per execution. Modes of measurement and Desired accuracy in measurements of different items of work as per IS : 1200 Rules for deduction in Masonry work, Plastering and pointing and painting work as per IS : 1200. Description / specification of items of building work as per PWD / DSR. Standard formats of Measurement sheet, Abstract sheet, Face sheet.

1.1	Introduction	1-1
1.1.1	Meaning of Estimating and Costing	1-1
1.1.2	Purpose of Estimating and Costing	1-2
1.1.3	Administrative Approval.....	1-2
1.1.4	Technical sanction	1-2
1.2	Types of Estimate	1-2
1.3	Detailed Estimate	1-2
1.4	Types and Uses of Estimates.....	1-3
1.4.1	Revised Estimate	1-3
1.4.2	Supplementary Estimate	1-3
1.4.3	Revised and Supplementary Estimate.....	1-3
1.4.4	Repair and Maintenance Estimate.....	1-4
1.4.5	Comparison between Revised Estimate and Supplementary Estimate	1-4
1.5	Renovation Estimate	1-4
1.6	Roles and Responsibilities of Estimator	1-5
1.7	Modes of Measurement.....	1-5
1.7.1	Units of Measurements	1-5
1.8	Desired Accuracy in Taking Measurement of Various Items	1-7
1.8.1	Rules for Deductions in Brickwork.....	1-7
1.8.2	Rules for Deduction in Plastering and Pointing.....	1-8

1.8.3	Rules for Painting Works.....	1-9
1.9	DSR (District Schedule Rates)	1-9
1.9.1	Brief Specifications.....	1-9
1.9.2	Brief Specifications from DSR - 2014	1-10
1.10	Standard formats.....	1-12
1.10.1	Measurement Sheet.....	1-12
1.10.2	Abstract Sheet	1-12
1.10.3	Face Sheet.....	1-13
1.11	Solved Examples	1-13
1.12	MSBTE Questions and Answers	1-14

UNIT II**Chapter 2 : Approximate Estimates****2-1 to 2-9**

Syllabus : Approximate estimate – Definition, Purpose. Methods of approximate estimate – Service unit method, Plinth area rate method, Cubical content method, Typical bay method, Approximate quantity method. Approximate estimate for roads, Railways, bridges/ culvert, irrigation projects and water supply projects. Numericals on service unit method and Plinth area rate method.

2.1	Approximate Estimate	2-1
2.1.1	Purpose of approximate estimate	2-1
2.2	Types of Approximate Estimate.....	2-1
2.2.1	Service Unit Method.....	2-2
2.2.2	Plinth Area Method.....	2-2
2.2.3	Cubical Content Method.....	2-2
2.2.4	Typical Bay Method.....	2-3
2.2.5	Approximate Quantity Method	2-3
2.3	Introduction of Approximate Estimate.....	2-3
2.3.1	Types of Area.....	2-3
2.3.2	Approximate Estimate of Roads and Highways	2-4
2.3.3	Approximate Estimate of Railway Project.....	2-4
2.3.4	Estimate for Bridges / Culverts.....	2-4
2.3.5	Approximate Estimate of Irrigation Project	2-5
2.3.6	Procedure For Preparing Estimate of Water Supply Project	2-5



2.4	Problems on Plinth area Method and Service Unit Method	2-5
2.5	MSBTE Questions and Answers	2-8

UNIT III

Chapter 3 : Detailed Estimate 3-1 to 3-35

Syllabus : Detailed Estimate : Definition and purpose, Data required for detailed estimate, Procedure of preparation of detailed estimate – Taking out quantities and Abstracting. Methods of Detailed Estimate : Unit quantity method and total quantity method. Long wall and short wall method (out to out and in to in method or PWD method), Centre line method. Bar bending schedule. Steel requirement for footing, column, beam, Lintel, chajja and slab. Provisions in detailed estimate : contingencies, work charged establishment, centage charges, water supply and sanitary charges and electrification charges. Prime cost, Provisional sum, provisional Quantities, Bill of quantities, Spot items or site items, Day work.

3.1	Definition of Detailed Estimate	3-1
3.1.1	Data Required for Detailed Estimate	3-1
3.1.2	Steps in Preparation of Detailed Estimate	3-2
3.1.3	Taking out Quantities and Abstracting	3-2
3.1.4	Purpose of Detailed Estimate	3-3
3.2	Methods of Detailed Estimates	3-3
3.2.1	Unit Quantity Method	3-3
3.2.2	Total Quantity Method	3-3
3.3	Long Wall and Short Wall Method	3-3
3.3.1	Methods for Taking out Quantities by Long Wall and Short Wall Method / P.W.D Method	3-3
3.3.2	Center Line Method	3-4
3.3.3	3-Dimensional View of Footing and Wall	3-4
3.4	Bar Bending Schedule	3-4
3.4.1	For Slab	3-14
3.4.2	Lintel and Chajja	3-17
3.4.3	Footing	3-18
3.5	Provisions to be Made in Detail Estimate	3-30
3.5.1	Contingencies	3-30
3.5.2	Work Charged Establishment	3-31
3.5.3	Centage Charges	3-31

3.5.4	Water Supply and Sanitary Arrangements	3-31
3.5.5	Internal Electrification	3-31
3.5.6	Prime Cost	3-31
3.5.7	Provisional Sum	3-31
3.5.8	Day Work	3-32
3.5.9	Provisional Quantities	3-32
3.5.10	Bill of Quantities	3-32
3.5.11	Spot or Site Items	3-32
3.6	MSBTE Questions and Answers	3-32

UNIT IV

Chapter 4 : Rate Analysis 4-1 to 4-28

Syllabus : Rate Analysis : Definition, purpose, importance and factors affecting. Lead (Standard and Extra), lift, overhead charges, water charges and contractors profit, Procedure of rate analysis. Task work : Definition, factors Affecting, types. Task work of different skilled labour for different items. Categories of labours, their daily wages, types and number of labours for different items of work. Load carrying capacity of different types of vehicles. Transportation of materials and their hire charges. Preparing rate analysis of different items of work – PCC, RCC work in (column, beam, lintel, slab), brick masonry. Stone masonry, Vitrified tile flooring, plastering, Wood work for doors.

4.1	Introduction	4-1
4.2	Rate Analysis	4-1
4.2.1	Purpose of Rate Analysis	4-1
4.2.2	Importance of Rate Analysis	4-2
4.3	Factors Affecting Rate Analysis	4-2
4.3.1	Major Factors	4-2
4.3.2	Minor Factors	4-3
4.4	Procedure of Rate Analysis	4-3
4.5	Meaning of Terms	4-4
4.5.1	Lead	4-4
4.5.2	Lift	4-4
4.6	Task Work	4-5
4.6.1	Task Work / Day Work / Out Turn	4-5
4.6.2	Factors Affecting Task Work	4-5



4.6.3	Task Work Per Day Skilled Labour (as per Maharashtra PWD).....	4-5
4.7	Categories of Labours	4-6
4.8	Conveyance Capacity of Different Types of Vehicle	4-6
4.8.1	Load Carrying Capacity	4-6
4.8.2	Load Carrying Capacity of Two Bullock Cart.....	4-6
4.9	Labour Required for Different Works	4-7
4.10	Solved Examples.....	4-8
4.11	MSBTE Questions and Answers.....	4-26

UNIT V

Chapter 5 : Estimate for Civil Engineering Works

5-1 to 5-42

Syllabus : Earthwork : Quantities for roads. Bunds and canal by - Mid sectional area method. mean sectional area method, Prismoidal formula method and trapezoidal formula method. Detailed estimate for septic tank, community well. Use of computer / software's / programmes for detailed estimate Preparation of Civil Engineering works.

5.1	Earthwork	5-1
5.1.1	Prismoidal Formula Method.....	5-1
5.1.2	Trapezoidal Formula.....	5-1
5.1.3	Mean - Sectional Area Methods.....	5-2
5.1.4	Mid Sectional Area Method.....	5-2
5.1.5	Solved Examples.....	5-2
5.2	Detailed Estimate for Septic Tank	5-17
5.2.1	Septic Tank	5-17
5.2.2	Solved Examples.....	5-17
5.3	Community Well	5-29
5.3.1	Solved Examples.....	5-29
5.4	Use of Computer / Software / Programmes for detailed Estimate Preparation of Building Works	5-36
5.5	MSBTE Questions and Answers.....	5-37



Appendix A : Solved MSBTE Question Paper of Winter 2019..... A-1 to A- 9

