

Final Year Degree Course In
CIVIL ENGINEERING (SEM - II)

SPPU

QUANTITY SURVEYING, CONTRACTS AND TENDERS

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- ★ Sample Question Papers of In-Sem & End-Sem Exams.
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 **NIRALI**
PRAKASHAN
ADVANCEMENT OF KNOWLEDGE

A TEXT BOOK OF

QUANTITY SURVEYING, CONTRACTS AND TENDERS

FOR
SEMESTER – II
FINAL YEAR (B.E.) DEGREE COURSE IN CIVIL ENGINEERING

As Per the New Revised Syllabus of
Savitribai Phule Pune University
(2012 Pattern)

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PREFACE TO THE NEW EDITION

We are glad and excited to announce that the First Edition of this book received an overwhelming response from the engineering student community, compelling us to release its New Edition within a very short period of time.

This New Edition has been updated with including all University Question Papers from December 2011 to May 2015 and we also given University Question Papers (2012 Pattern) In Sem. February 2016 to End Sem. November 2017.

Special care has been taken to maintain high degree of accuracy in the theory and numericals throughout the book.

We take this opportunity to express our sincere thanks to Dineshbhai Furia of Nirali Prakashan, a reputed pioneer in the publication field. Our special thanks to Jignesh Furia for their effective cooperation and great care in bringing out this revised edition. We also appreciate the efforts of M. P. Munde and the entire staff of Engineering Books Deptt. of Nirali Prakashan namely Mrs. Deepali Lachake (Co-ordinator) for bringing this book to the students in a timely manner.

We sincerely hope that this "New Edition" will also be warmly received by all concerned as in the past.

Valuable suggestions from our esteemed readers to improve the book are most welcome and highly appreciated.

Pune

Authors

PREFACE TO THE FIRST EDITION

We are very glad to present a textbook on “**Quantity Surveying, Contracts and Tenders**”. This book is strictly written as per the New Revised Syllabus of Savitribai Phule Pune University, Pune (2012 Pattern) for the students of final year degree course in Civil Engineering.

This book is as per new revised examination scheme which has been implemented from this academic year. According to this, In-semester examination carries 30 Marks over first three units and End-semester examination carries 70 marks for entire syllabus of which the first three units will carry 20 marks and unit 4, 5, and 6 will carry 50 marks.

We have given University Question Papers at the end of the book. Also we have given Sample Question Papers of In-Semester University Examination (30 Marks) and End-Semester University Examination (70 Marks) in this book for the practice.

We have tried to provide the best possible material in simple and lucid language to the students preparing for degree course. The subject is divided in to 6 units and each unit is explained thoroughly with diagrams and examples. So, we are sure that this book will fulfill all needs of the subject. Sufficient numbers of questions are also included at the end of each chapter for the revision of the subject.

We would like to express our gratitude to the many people who saw us through this book; to all those who provided support for this book.

We are very thankful to the management of our respective institutes for their continuous support and encouragement.

Above all, we want to thank our family members and friends, who supported and encouraged us in spite of all the time it took us away from them. It was a long and difficult journey for them.

We gratefully acknowledge co-operation from **Shri. Dineshbhai Furia, Shri. Jignesh Furia, Mrs. Nirali Verma, Shri. M.P. Munde** and **Mrs. Deepali Lachake** (Co-ordinator) of **Nirali Prakashan**.

Though every effort has been made to eliminate all types of errors, yet some error might have been left unnoticed. However, further improvement if you find any, you can mail on [jyotiprakash.nayak@sitcc.org](mailto: jyotiprakash.nayak@sitcc.org).

SYLLABUS

Unit I : Introduction and Approximate Estimates

[6 Lectures]

(a) Introduction to Estimates and Related Terms: Definitions of estimation and valuation. Significance (application) of the Course. Purpose of estimation. Type of estimates, data required for estimation as a pre requisite. Meaning of an item of work, and enlisting the items of work for different Civil Engineering projects. Units of measurement. Mode of measurement of building items/ works. Introduction to components of estimates: face sheet, abstract sheet (BOQ), measurement sheet, Rate Analysis, lead statement. Provisional sum and prime cost items, contingencies, work charge establishment, centage charges. Introduction to D. S. R

(b) Approximate Estimates: Meaning, purpose, methods of approximate estimation of building and other civil engineering projects like roads, irrigation/ water supply, sanitary engineering, electrical works.

Unit II : Taking out quantities and Detailed estimate up to plinth

[6 Lectures]

(a) Methods of Estimating : P.W.D. and center-line methods of working out quantities. Calculation of quantities for Load bearing and R.C.C framed structures up to plinth,

(b) Detailed Estimates, Factors to be considered while Preparing Detailed Estimate, Detailed estimates of Load bearing and R.C.C framed structures up to plinth only.

Unit III : Detailed Estimation for Super Structure and Valuation

[6 Lectures]

(a) Calculation of quantities and detailed estimate for Load bearing and framed structures above plinth (super structure). Deduction rules for different items of work as per IS: 1200.

(b) Valuation: Purpose of valuation. Meaning of price, cost and value. Factors affecting 'value'. Types of value: only Fair Market Value, Book Value, Salvage/ Scrap Value, Distressed Value and Sentimental Value. Concept of free hold and lease hold property. Estimation versus valuation. Meanings of depreciation and obsolescence.

Unit IV : Specifications and Rate Analysis

[6 Lectures]

(a) Specifications: Meaning and purpose, types. Drafting detailed specifications for materials, quality, workmanship, method of execution, mode of measurement and payment for major items like, excavation, stone/ brick masonry, plastering, ceramic tile flooring, R.C.C. work.

(b) Rate Analysis: Meaning and factors affecting rate of an item of work, materials, sundries, labour, tools and plant, overheads and profit. Working out Rate Analysis for the items mentioned in specifications above. Task work or out turn, factors effecting task work.

Unit V : Tendering and Execution of Works**[6 Lectures]**

(a) Tenders: Definition. Methods of inviting tenders, tender notice, tendering procedure, Pre and post qualification of contractors, tender documents. 3 bid/ 2 bid or single bid system. Qualitative and quantitative evaluation of tenders. Comparative statement, Pre-bid conference, acceptance/ rejection of tenders. Various forms of BOT and Global Tendering, E-tendering.

(b) Methods of Executing Works: PWD procedure of work execution, administrative approval, budget provision, technical sanction. Methods of execution of minor works in PWD: Piecework, Rate List, Daily Labour. Introduction to registration as a contractor in PWD.

Unit V : Contracts and Arbitration**[6 Lectures]**

(a) Contracts: Definition, objectives and essentials of a valid contract as per Indian Contract Act(1872), termination of contract. Types of contracts: only lump sum, item rate, cost plus. Conditions of contract: General and Specific conditions. Conditions regarding EM, SD, and time as an essence of contract, conditions for addition, alteration, extra items, testing of materials, defective work, subletting, etc. Defect liability period, liquidated damages, retention money, interim payment or running account bills, advance payment, secured advance, final bill.

(b) Arbitration: Introduction to Arbitrations as per Indian Arbitration and Conciliation Act (1996) Meaning and need of arbitration, qualities and powers of an Arbitrator.

(c) Brief introduction to laws related to professional liabilities

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**INTRODUCTION TO ESTIMATES
AND RELATED TERMS****1.1 INTRODUCTION**

Before any engineering project is to be constructed, it is necessary to know its estimated cost to ascertain whether the required funds can be made available for its completion or not. If the funds available are more than the estimated cost of the work, the execution of the work can be started. If, however, the available funds are less than the estimated cost, then either the work may be executed in parts or its specification can be altered to bring down its cost within the available funds. The actual cost of construction (which will be known after its completion) should not exceed the estimated cost of the work.

Definition : To know the cost of the proposed work, it is required to prepare a detailed estimate of the proposed work. An estimate is a probable cost of the work, arrived by mathematical calculations based on the measurement of quantities of various items of work involved in the work. The quantities of the various items of work are then multiplied by the present market rates for those items to arrive at the cost of all such items. Summation of costs of all such items gives the total estimated cost of the work.

1.2 DATA REQUIRED FOR PREPARATION OF AN ESTIMATE

In order to prepare a detailed estimate of the proposed work, the following information is required :

- (i) **Complete Set of Detailed Drawings :** In order to work out the quantities of various items of work, a complete set of detailed drawings consisting of plan, elevation, sections and foundation details etc. is required. The relevant dimensions i.e. length, breadth, depth or height of the items, whose quantities are to be worked out, can be measured from such drawings.
- (ii) **Specifications of Items of Works :** The rate of an item depends upon the specifications of the work. Specifications provide information regarding type of construction, quality of materials, proportion of mixes, manner in which the work is to be executed, etc.
- (iii) **Prevalent Rates of Items of Construction :** After the quantities of various items of work involved are calculated, they are to be multiplied by the current market rates of those items. The Government department such as Buildings and Communication, Irrigation and Power Department prepares schedule of rates for all items of work pertaining to the department for a district or area, on the basis of

analysis of rates of items. A booklet called 'District Schedule of Rates' (D.S.R) is available for sale in such Government Organisations.

- (iv) **Standard Mode of Measurement** : I.S. 1200 has specified the procedure of measurement of various items of work, standard deductions to be made if any, the accuracy of measurement etc. and is to be followed while preparing estimates.
- (v) Details of foundation strata likely to be encountered.
- (vi) The exact location of the work site.
- (vii) The physical condition of the work site.

It is usual practice to enclose a brief report containing information about the proposed work i.e. project as regards the following :

- The history and necessity of the proposed work.
- The exact location and condition of the work site.
- Details of soil strata at the site.
- The total cost of the proposed work.
- Source of the finance required for the completion of the work.
- Probable period of completion of the work.

1.2.1 Purposes of detailed estimate

(W-2010)

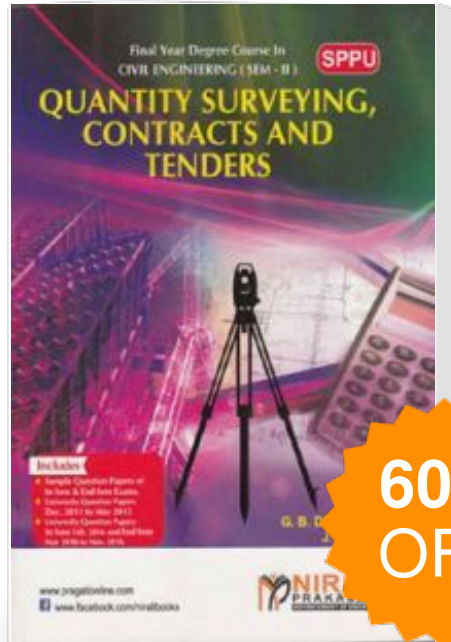
- In Government Organisation, a detailed estimate is required for obtaining *technical sanction* from the competent authorities for the proposed work.
- A detailed estimate is also required for the preparation of contract (agreement) document.
- The detailed estimates serve as a guide during the execution of the work.
- It helps in computing the quantities of materials required and labour to be employed for the completion of various items of construction.
- It is very useful in the efficient planning and programming of all activities required for the speedy completion of the work.
- It enables to prepare bar-chart, material schedules etc. for the work.

1.2.2 THE USES OF ESTIMATION

(W-2010)

- To get appropriate idea of the proposed work before its execution.
- It helps in working out the quantities of various materials required and also in preparation of material schedules.
- The labour force required for various items of construction can be worked out considering the specified work time.

Quantity Surveying, Contracts And Tenders



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