Techno India NJR Institute of Technology

Quantity Surveying & Valuation

(6CE4-23)

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Course Overview:

This course is structured in such a way that its aim is to provide the student with the ability to estimate the quantities of item of works involved in buildings, water supply and sanitary works, road works and irrigation works, and also to equip the student with the ability to do rate analysis, valuation of properties and preparation of reports for estimation of various items. Main objective is to develop in the student the art and skill whereby a monetary value can be placed on the volume

of work previously measured. Also other objectives include to develop an awareness of those factors that affect the cost of construction work and to analyse the influences that effect change in

these factors. Course helps students and encourage the habit of systematically recording all those statistics which are the stock in trade of the good estimator.

Estimating is the most important of the practical aspects of construction management, and the subject deserves the closest attention of one aspiring to a career in the profession. It is a comparatively simple subject to understand; however, as it brings one up against practical work, methods and procedure, knowledge of it cannot be acquired without close application

Course Outcomes:

CO.NO.	Cognitive Level	Course Outcome
1	Analysis	Students will evaluate the estimate of quantities for a Residential Building & Abstract cost Estimate.
2	Evaluation	Students will be able analyze the rates of work quantities and labour.
3	Synthesis	Students will be able to evaluate the calculation regarding earth work quantity for roads and canals, Analyse different types of contracts, tender document for building & valuation
4	Synthesis	Students will remember the concepts of Valuation.
5	Application	Student will create Bill of Quantities.

Prerequisites:

1. Basic understanding of Plans and Drawings.

2. Basic understanding of calculations involved.

3. Understanding of finding area and volumes.

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Course Outcome Mapping with Program Outcome:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO365.1	3	2	2	2	2	2	1	1	2	1	2	2	2	3	2
CO365.2	3	2	2	2	2	2	1	1	2	1	2	2	2	3	2
CO365.3	3	2	2	2	2	2	1	1	2	1	2	2	2	3	2
CO365.4	2	3	3	3	2	1	1	1	2	2	1	2	2	2	2
CO365.5	2	3	3	3	2	1	1	1	2	2	1	2	2	2	2
CO365 (AVG)	2.6	2.4	2.4	2.4	2	1.6	1	1	2	1.4	1.6	2	2	2.6	2

Course Coverage Module Wise:

Lecture No.	Experiment No.	Topic
1	1	Preliminary Estimate (Plinth Area and Cubic Content)
2	2	Detailed Estimate of buildings (Long wall-Short wall and Centre line method)
3	3	Detailed Estimate of buildings (Long wall-Short wall and Centre line method)
4	4	Detailed Estimate of buildings (Long wall-Short wall and Centre line method)
5	5	Rate Analysis of different Items of Works (Earthwork, Concrete Work, DPC
6	6	Rate Analysis of different Items of Works (Earthwork, Concrete Work, DPC
7	7	Earthwork Calculation for Roads, Irrigation Canals and Channels (cutting and filling)
8	8	Earthwork Calculation for Roads, Irrigation Canals and Channels (cutting and filling)
9	9	Valuation of Buildings and Properties

Faculty Lab Manual Link

> https://drive.google.com/file/d/1rOPZZFjhIBhcdY1mXXhrDR1j6E2BJGMF/view?usp=share_link

Assessment Methodology:

1. Practical exam Of Environmental lab Experiment
2. Internal exams and Viva Conduct.
3. Final Exam (practical paper) at the end of the semester.

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LAB MANUAL

LIST OF EXPERIMENT

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EXPERIMENT NO. 1

Aim: Preparation of detailed estimate of building (using long wall and short wall method).

Requirement: given plan and section of building, find out the length of long wall and length of short wall, etc.

Procedure:
1. Longer walls in a building are considered as long walls and measured from out to out.
2. Shorter walls in a building are considered as short wall and measured from in to in.
3. These lengths of long wall and short wall are multiplied separately by the breath and height of the corresponding layer and added to get quantity and it changes according to area.
4. Find length of long and short wall.
5. First calculate center to center lengths individually from the plan.

Calculation:
1. Length of long wall=parallel to x-axis=(c/c distance +width of Item).
2. Length of short wall=parallel to y-axis=(c/c distance-width of item).

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total quantity of all item of work is………………..

EXPERIMENT NO. 2

Aim: preparation of detailed estimate of building (using center line method).

Requirement: given plan and section of building, find out the length of long wall and length of short wall, etc.

Procedure:

1. In this method total length of wall is equal to sum of length of long wall and length of short wall.
2. These total length of walls are multiplied by the breath and height of the corresponding layer and added to get quantity.

Calculation:

Total center Length of walls = center length of long wall + center length of short wall.

Precaution:

3. All units of item of works are correct.
4. Calculation should be done carefully.

Result: Total quantity of all item of work is………………..

EXPERIMENT NO. 3 (a)

Aim: Analysis of rate (for concrete work).

Requirement: given the grade of concrete, rate of cement, rate of sand, rate of course aggregate, rate of labor, etc.

Procedure:
1. Find out the quantity of cement.
2. Find out the quantity of sand.
3. Find out the quantity of course aggregate.
4. Find total rate.

Calculation and formula:
1. 1bag cement=0.0345m3 =50kg=34.5liters.
2. 1 m3 of wet concrete=1.54 m3 of dry concrete.
3. Total rate =rate of material +rate of labor.

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total rate of concrete work is………………..

Aim: Analysis of rate (for brick work).

Requirement: given the size of bricks, rate of cement, rate of sand, rate of labor rate of brick , etc.

Procedure:
1. Find out the quantity of cement.
2. Find out the quantity of sand.
3. Find total no. of bricks used.
4. Find total rate.

Calculation and formula:

1. 1bag cement=0.0345m3 =50kg=34.5liters.
2. vol. of 1 brick with mortar (nominal size) =200mm*100mm*100mm.
3. vol. of 1 brick without mortar (actual size) =190mm*90mm*90mm.
4. Total rate =rate of material +rate of labor.

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total rate of bricks work is………………..

EXPERIMENT NO. 3(c)

Aim: Analysis of rate (for plaster work).

Requirement: given the size of bricks, rate of cement, rate of sand, rate of labor ,etc.

Procedure:
1. Find out the quantity of cement.
2. Find out the quantity of sand.
    3. Find total no. of bricks used.
    4. Find total rate.

Calculation and formula:

1. 1bag cement=0.0345m3 =50kg=34.5liters.
2. vol. of 1 brick with mortar (nominal size) =200mm*100mm*100mm.
3. vol. of 1 brick without mortar (actual size) =190mm*90mm*90mm.
4. Total rate =rate of material +rate of labor.

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total rate of bricks work is………………..

EXPERIMENT NO. 3(d)

Aim: Estimation of quantity of reinforcement (for beam).

Requirement: given the details of reinforcement (for column, beam, slab, etc.).

Procedure:
1. Find out the quantity of bent up bars.
2. Find out the quantity of stirrups.
    3. Find out the quantity of hanger/top bars.
    4. Find total quantity and rate.

Calculation and formula:
1. Length of straight bar=overall spans +length of hooks.
2. Hook length (for one end) =9*dia. of bar.
3. Hook length (for both end) =18*dia. of bar.
4. Total rate =rate of material + rate of labor.

Calculation table:

SN.	DESCRIPTION	NO.	LENGTH (m)	BREAT(m)	HEIGHT(m)	QUANTITY(kg)

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total rate of steels work is……………….

EXPERIMENT NO. 4

Aim: preparation of approximate estimate for road project.

Requirement: given the details of road work (like GL, natural surface level, gradient, side slopes, change of level, etc.)

Procedure:
1. Find out the cutting area.
2. Find out the filling area.
   3. Find out the volume of cutting.
   4. Find out the volume of filling.
   5. Find out the total volume of cutting and filling.

Calculation table:

SN.	ROAD	DISTANCE(M)	CUT AREA (M2)	MEAN AREA(M2)	LENGTH(M)	CUTTING VOLUME(M3)

Formula used:
1. Area = (p/4)*d
2. Area of trapezoidal section = (b+ b)

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total rate of road work is………………..

EXPERIMENT NO. 5

Aim: Estimating cost of building on plinth area method.

Requirement: given the details of building works and there rates.

Procedure:
1. Find out the total area of building (including walls, verandah, corridors, etc.)
2. Find out the total area and cost.
    3. Find out other costs (water supply, electricity, special services).
    4. Find grand total.

Calculation and formula:
1. Total area/plinth area=carpet area +corridor +stair +walls +etc.

Calculation table:

SN.	DESCRIPTION	LENGTH(m)	BREATH(m)	HEIGHT(m)	QUANTITY(kg)

)

Precaution:
1. All units of item of works are correct.
2. Calculation should be done carefully.

Result: Total cost of building is……………….