Techno India NJR Institute of Technology

Quantity Surveying & Valuation

(6CE4-23)

Session 2022-23

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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.

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

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

3rd Year - VI Semester: B.Tech. (Civil Engineering)

6CE4-23: QUANTITY SURVEYING AND VALUATION

Credit: 1 **Max. Marks: 50(IA:30,ETE:20)**

0L+0T+2P **End Term Exam: 2 Hours**

Contents
1. Preliminary Estimate (Plinth Area and Cubic Content) 2. Detailed Estimate of buildings (Long wall-Short wall and Centre line method) 3. Rate Analysis of different Items of Works (Earthwork, Concrete Work, DPC, Stone masonry, Brickwork, RCC, Roofing, Flooring, and Finishing etc.) 4. Earthwork Calculation for Roads, Irrigation Canals and Channels (cutting and filling) 5. 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.

CIVIL ENGINEERING

LAB MANUAL

6CE4-23: QUANTITY SURVEYING AND VALUATION

DEPARTMENT OF CIVIL ENGINEERING

LAB MANUAL

LIST OF EXPERIMENT

1. Estimation of building (long wall and short wall method)

2. Estimation of building (center line method)

3. (a) Analysis of rate for concrete work

   (b) Analysis of rate for brick work

   (c) Analysis of rate for plaster work

   (d) Estimate quantity of reinforcement

4. Preparation for approximate estimate for road project

5. Estimating cost of building on plinth area method

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 lengths 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:

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. 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……..

EXPERIMENT NO. 3(b)

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)	BREADTH(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…….

TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY UDAIPUR

Civil Engineering

B. TECH III– YEAR (VI Sem)

SUBJECT: Quantity Surveying & Valuation

(6CE4-23)

Quiz

1. To make out an estimate for a work the following data are necessary-Drawing, Specification and _____

a) materials

b) rates

c) labours

d) transportation

(b)

2. _____ is required for preliminary studies of various aspects of a work or project.

a) Supplementary Estimate

b) Plinth Area Estimate

c) Revised Estimate

d) Abstract Estimate

(d)

3. Approximate cost of a hostel building for 100 students @Rs.10000/- per student works out as Rs. 10 lakhs.

a) True

b) False

(a)

4. Per kilometre basis depending on the nature of road, for 10 km of a state highway approx. cost @ Rs. 50000/- per 1 km works out as Rs. 5 lakh.

a) True

b) False

(b)

5. The approx. cost of 10 km length of irrigation channel of 3 cu m per sec. capacity @ Rs.70000/- per km works out as Rs.7 lakh.

a) True

b) False

(a)

6. Approx. cost of a bridge of 3 spans of 50 m each span @Rs.30000/- per running m of span comes to 3*50*30000 = Rs. 45 lakhs.

a) True

b) False

(a)

7. Approximate cost of sewerage project for a population of one lakh@ Rs. 10/- head works out as Rs. 10 lakh.

a) True

b) False

(b)

8. Cube rate estimate is less accurate as compared to the plinth area estimate as the height of the building is also compared.

a) False

b) True

(b)

9. For storeyed building plinth area estimate is not prepared for each storey separately.

a) True

b) False

(b)

10. _____ is prepared on the basis of plinth area of building, the rate being deducted from the cost of similar building having similar specification, heights and construction, in the locality.

a) Cube Rate Estimate

b) Supplementary Estimate

c) Maintenance Estimate

d) Plinth Area Estimate

(d)

11. _____ is the amount provided in the estimate and bill of quantities for some specialised work to be done by a specialised firm; whose details are not known at the time of preparing estimate.

a) Prime cost

b) Provisional sum

c) Capital cost

d) Building cost index

(b)

12. In this method approx. total length of walls is found in running metre and this total length multiplied by the rate per running metre of wall gives a fairly accurate cost.

a) Annual repair

b) Item rate estimate

c) Approximate quantity method estimate

d) Cubical content estimate

(c)

13. _____ estimate is a detailed estimate and is prepared to maintain the structure or work in proper order and safe condition.

a) Supplementary and revised estimate

b) Maintenance estimate

c) Item rate estimate

d) Revised estimate

(b)

14. A large work or project may consists of several building or small works and each of these work is known as _____

a) sub-work

b) sub-project

c) sub-head

d) sub-construction

(a)

15. The term _____ is used to denote a procedure of costing or valuing an item of work on the basis of actual labourers and materials required.

a) prime cost

b) hour-work

c) day-work

d) sub-work

(c)

16. Which estimate is expected to be least accurate?

A. Preliminary estimate

B. Plinth area estimate

C. Detailed estimate

D. Revised estimate

(b)

17. A revised estimate is usually prepared when the original estimate has exceeded by more than

A. 1%

B. 2%

C. 10%

D. 100%

(c)

18. Annual repair estimate is usually not allowed to exceed

A. 10% of capital cost

B. 5% of capital cost

C. 2% of capital cost

D. 5% of capital cost

(c)

19. Which of the following is necessarily an accurate estimate?

A. Plinth area estimate

B. Cubical content estimate

C. Revised estimate

D. None of the above

(b)

20. Estimate for electric wiring that is light, fan, plug points etc. is usually made in terms of

A. Total power at mains in KW

B. Amperage of every point

C. Type of points

D. Number of points

(A)

B. TECH III– YEAR (VI Sem)

SUBJECT: Quantity Surveying & Valuation

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Viva

1. What is Estimate?
2. Units of measurements for various items of building construction.
3. List out various Items of building Construction?
4. List out types of Approximate Estimate?
5. What is detailed estimate?
6. Data required for Detailed Estimate?
7. What is abstract estimate?
8. What are methods to be adopted for volume calculating?
9. Define analysis of rates.
10. Define a tender
11. What are the types of culvert
12. Define 'contract'
13. What are the types of estimate
14. Briefly explain about preliminary Estimate
15. Define detailed estimate
16. Define Abstract estimate
17. Define quantity surveyor
18. Write the duties of quantity surveyor.

19. What are factors to be considered in design of septic tank? The following factors should be taken into consideration:
20. .Define lead.
21. Define lift.
22. The actual expenditure incurred in the construction of a school building which have a total length of main walls 140 m is Rs.4.97 lakhs. Estimate the approximate cost of a similar school building which will have 180 m length of main walls.
23. Define estimate.
24. Briefly explain about revised estimate
25. Calculate the quality of brickwork in an arch over a 1.80 m span opening. The arch is 40 cm. thick and the breath of a wall is 40 cm
26. Define Floor area
27. Define Carpet area
28. Define Plinth area
29. Briefly explain about Out to Out and in to in method.
30. Briefly explain about bay method.