Estimation and costing in civil engineering lecture notes pdf



SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Estimation and Costing UNIT INTRODUCTION TO THE SUBJECT 1 1.1 DEFINITION OF ESTIMATING AND COSTING Estimation is the technique of calculating or Computing the various quantities and the expected Expenditure to be incurred on a particular work or project. In case the funds avilable are less than the estimated cost the work is done in part or by reducing it or specifications are altered, the following require-ment are necessary for preparing an estimate. a) Drawings like plan, elevation and sections of important points. b) Detailed specifications are altered, the following require-ment are necessary for preparing an estimate. a) Drawings like plan, elevation and sections of important points. b) Detailed specifications are altered, the following require-ment are necessary for preparing an estimate. Standard schedule of rates of the current year. 1.2 NEED FOR ESTIMATION AND COSTING 1. Estimate give an idea of the work. 3. Estimate is feasibility can be determined i... whether the project could be taken up with in the funds available or not. 2. Estimate gives an idea of the corrent year. required to invite the tenders and Quotations and to arange contract. Estimate is also required to control the execution of work. Estimate decides whether the proposed plan matches the following operations Preparing detailed Estimate. Calculating the rate of each unit of work Preparing abstract of estimate 1.4 DATA REQUIRED TO PREPARE AN ESTIMATE 1. 2. 3. Drawings i.e. plans, elevations, sections etc. Specifications. Rates. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Introduction to the Subject 2 1.4.1 DRAWINGS If the drawings are not clear and without complete dimensions the preparing an estimate. 1.4.2. SPECIFICATIONS a) General Specifications: This gives the nature, quality, class and work and materials in general terms to be used in various parts of wok. It helps no form a general idea of building. b) Detailed Specifications: These gives the detailed description of the various parts of work. 1.4.3. RATES: For preparing the estimate the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item. 2. The rates of various materials. 4. The wages of labour, skilled or unskilled or unskilled of masons, carpenters, Mazdoor, etc., 1.5 COMPLETE ESTIMATE: Most of people think that the estimate of a structure includes cost of land, cost of materials and labour, But many other direct and indirect costs included The Complete Estimate and is shown below. Cost of Surveying land Cost of Brochorage Cost of Permit fees for Verification if any labour constrution water, of deeds and electricity from execution of plan, estimate and design CE2402 / ESTIMATION AND QUANTITY SURVEYING Cost of supervision VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 3 LECTURE NOTES Estimation and Costing 1.6 LUMPSUM: While preparing an estimate, it is not possible to workout in detail in case of petty items. Items other than civil engineering such items are called lumpsum items or simply L.S.Items. The following are some of L.S. Items in the estimate. 1. Water supply and sanitary arrangements. 2. Electrical installations like meter, motor, etc., 3. Architectural features. 4. Contingencies and unforeseen items. Ingeneral, certain percentage on the cost of estimation is alloted for the above L.S.Items Even if subestimates prepared or at the end of execution of work, the actual cost should not exceed the L.S. amounts provided in the main estimate. 1.7 WORK CHARGED ESTABLISHMENT: During the construction of a project considerable number of skilled su-pervisors, work assistance, watch men etc., are employed on temporary basis. The salaries of these persons are drawn from the L.S. amount alloted towards the work charged establishment. that is, establishment which is charged directly to work. an L.S. amount of 1¹/₂ to 2% of the estimated cost is provided towards the work charged establishment. EXERCISE Short Answer Questions 1. State the requirements of an estimate? 2. Briefly Explain need for estimation? 3. What is work charged establishment? CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 4 Chapter 2 MEASUREMENTS: The units of measurements are mainly categorised for their nature, shape and size and for making payments to the contractor and also. The principle of units of measurements normally consists the following: a) Single units work like doors, windows, trusses etc., are expressed in numbers. b) Works consists areal surface measurements involve area like plastering, white washing, partitions of specified thickness 2 etc., are expressed in square meters (m) d) Works consists cubical contents which involve volume like earth work, cement concrete, Masonry etc are expressed in Cubic metres. [BASED ON IS 1200 REVISED] Sl. No. I II Particulas of item Earth work: 1. Earth work in Excavation 2. Earthwork in filling in plinth Concrete: 1. Lime concrete in Lintels 3. R.C.C. in roof terracing (thickness specified) Units of Measurement Units of payment cum cum Per%cum Per%cum cum Per%cum cum cum cum cum cum percum percum percum percum percum percum percum percum percum sqm persqm CE2402 / ESTIMATION AND QUANTITY SURVEYING VII 6. Cement concrete bed 7. R.C. Sunshade (Specified Width & Hight Damp ProofCource (D.P.C) (Thickness should be mentioned) Brick work: 1. Brickwork in foundation 2. Brick work in super structure 4. Thin partition walls 5. Brick work in arches 6. Reinforced brick work: 1. Door sand windows (rames or chowkhats, rafters beams 2. Shutters of doors and windows (thickness specified) 3. Doors and windows fittings (like hinges, tower bolts, sliding bolts, handles) Steel work 1. Steel reinforcement bars etc in R.C.C. and R.B.work. quintal 2. Bending, binding of steel Reinforcement 3. Rivets, bolts, & nuts, Anchor bolts, Lewis bolts, Holding down bolts. 4. Iron hold fasts 5. Iron railing (height and types specified) 6. Iron grills LECTURE NOTES Estimation and Costing cum per cum cum for quintal per SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 6 Measurement of Materials and Works VIII IX X XI XII XIII XIV Roofing 1. R.C.C. and R.B.Slab roof (excluding steel) 2. L.C. roof over and inclusive of tiles or brick or stone slab etc (thickness specified) 3. Centering and shuttering form work 4. A.C.Sheet roofing Plastering, points&finishing 1. Plastering-Cement or Lime Mortar (thickness and proportion specified) 2. Pointing, varnishing (number of coats specified) 5. Painting, varnishing (number of coats specified) 2. Pointing 3. White washing, cement wash (number of coats specified) 4. Distempering (number of coats specified) 4. Distempering (number of coats specified) 5. Painting, varnishing (number of coats specified) 5. Painting, varnishing (number of coats specified) 4. Distempering (number of coats specified) 5. Painting, varnishing (number of coats specified) 5. Painting (number of co 75mm lime concrete floor (including L.C.) 2. 25mm or 40mm C.C. floor 3. Doors and window sills (C.C. or cement mortar plain) Rain water pipe /Plain pipe Steel wooden trusses Glass pannels(supply) Fixing of glass panels or cleaning cum per sqm sqm sqm sqm per sqm sqm per sqm per sqm per sqm per sqm per no. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 7 2.2 RULES FOR MEASUREMENT : LECTURE NOTES Estimation and Costing The rules for measurement of each item are invaribly described in IS-1200. However some of the general rules are listed below. 1. Measurement shall be made for finished item of work and description of each item shall include materials, transport, labour, fabrication. 2. In booking, the order shall be in sequence of length, breadth and height or thickness. 3. All works shall be measured subject to the following tolerances. i) Linear measurement shall be measured to the nearest 0.01 m. ii) Areas shall be measured to the nearest 0.01 sq.m iii) Cubic contents shall be worked-out to the nearest 0.01 cum 4. Same type of work under different conditions and nature shall be measured separately under separately under separately and the heights shall be measured separately and the heights shall be measured separately and the heights shall be measured separately and the height separately and the described: a) from foundation to plinth level b) from plinth level to First floor level c) from Fist floor level and so on. 2.3 METHODS OF TAKING OUT QUANTITIES: The quantities like earth work, foundation concrete, brickwork in plinth and super structure etc., canbe workout by any of following two methods: a) Long wall - short wall method b) Centre line method. c) Partly centre line and short wall method. a) Long wall-short wall method: In this method, the wall along the length of room is considered to be long wall is said to be short wall. To get the CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Measurement of Materials and Works 8 length of long wall, (out to out) may be calculated after adding half breadth at each end to its centre line length. Thus the length of short wall, measured into in and may be found by deducting half breadth from its centre line length at each end. The length of long wall usually decreases from earth work to brick work in super structure while the short wall increases. These lengths are multiplied by breadth and depth to get quantities. b) Centre line method: This method is suitable for walls of similar cross sections. Here the total centre line length is multiplied by breadth and depth of respective item to get the total quantity at a time. When cross walls or partitions or verandah walls join with mainall, the centre line length gets reduced by half of breadth for each junction. such junction or joints are studied caefully while calculating total centre line length. The estimates prepared by this method is adopted when external (i.e., alround the building) wall is of one thickness and the internal walls having different thicknesses. In such cases, centre line method is applied to external walls and long wallshort wall method is used to internal walls. This method suits for different thicknesses walls and diffeent level of foundations. Because of this reason, all Engineering departments are practicing this method. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 9 Estimation and Costing P.B.-1: From the Drawing given below determine (a) Earth work exca-vation (b) CC (1:5:10) Bed (c) R.R.Masonry in C.M. (1:6). Single Roomed Building (Load Bearing type structure) Note: All Dimensions are in 'M' CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 10 Measurement of Materials and Works Long wall - Short wall S 2 L B H Q Explanation 6.2 0.9 1.4 15.264 L=5.3+.45+.45=6.2 D= 0.3+0.5+0.6 = 1.4 3.4 0.9 1.4 8.568 L= 4.3-0.45-0.45= 3.4 Total 24.192 m 2. C.C.(1:4:8) bed for foundation a) Long walls 2 b) Short walls 2 6.2 0.9 0.3 3.4 0.9 0.3 3.48 1.836 Total 5.184 m 3. R.R.Masonry in CM (1:6) for a) Footings i) Long walls 2 ii) Short walls 2 5.9 0.6 0.5 3.7 0.6 0.5 0.5 0. $0.6\ 3\ 3\ L = 5.3 + 0.3 = 5.9\ L = 4.3 - 0.3 = 3.7\ m\ 3\ 3.105\ L = 5.3 + 0.225 + 0.225 = 5.75\ 2.079\ L = 4.3 - 0.225 + 0.225 + 0.225 = 5.75\ 2.079\ L = 4.3 - 0.25\ L =$ 7.20 L=4.3-0.15-0.15=4.0 m3 Total 17.28 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 11 Centre Line Method S.No. Particulars of Items No. 1. Earth Work excavation for foundation 1 5.3 LECTURE NOTES Estimation and Costing L B H Q Explanation 3 19.2 0.9 1.4 24.192 m L=2(5.3+4.3)=19.2 4.3 2. C.C.(1:4:8) bed for 1 foundation 3. R.R.Masonry in CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 b) Bas YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 12 Measurement of Materials and Works EXERCISE I. Short Answer Questions 1. List the difference between centre line method and long wall-short wall method and long wall-short wall method. 2. What are the rules to be followed while taking the mesurements? Mension the units for the following items. a) flooring b) R.R.Masonry c) Plastering for pointing d) Damp proof course e) R.C. sunshade (Sepcified width and thickness) II. Essay type questions 1. From the Drawing given below determine (a) Earth work excavation (b) CC (1:5:10) Bed (c) R.R.Masonry in C.M. (1:6) (d) Brick Work in C.M.(1:6). by (a) longwall - short wall method (b) Centre line Method CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 13 LECTURE NOTES Estimation and Costing Chapter 3 TYPES OF ESTIMATES 3.1 DETAILED ESTIMATE: The preparation of detailed estimate consists of working out quantities of various items of work and then determine the cost of each item. This is prepared in two stages. i) Details of measurements and calculation of quantities: The complete work is divided into various items of work such as earth work concreting, brick work, R.C.C. Plastering etc., The details of measurements and calculation of quantities: The complete work is divided into various items of work such as earth work concreting, brick work, R.C.C. Plastering etc., The details of measurements are taken from drawings and entered in respective columns of prescribed proforma. the quantities are calculated by multiplying the values that are in num-bers column to Depth Column as shown below: Details of measurements form Length Breadth Depth/ Description S.No. No (L) (B) Height Quantity Explanatory of Item Notes m m (D/H)m ii) Abstract of Estimated Cost : The cost of each item of work is worked out from the quantities that already computed in the detals measurement form at workable rate. But the total cost is allowed form is known as abstract of estimated form. 4% of estimated form. 4% of estimated form is known as abstract of estimated form. QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 14 Types of Estimates ABSTRACT OF ESTIMATE FORM Item No. Description/ Quantity Unit Particulars Rate Per (Unit) Amount The detailed estimate should accompained with i) Report ii) Drawings (plans, elevation, sections) iv) Design charts and calculations v) Standard schedule of rates. 3.1.1.Factors to be consistered While Preparing Detailed Esti-mate: i) Quantity and transported definitely at cheaper rate. ii) Location of site: The site of work is selected, such that it should reduce damage or in transit during loading, unloading, stocking of mateirals. iii) Local laboures are consideed while preparing the detailed estimate. 3.2 DATA: The process of working out the cost or rate per unit of each item is called as Data. In preparation of Data, the rates of materials and labour are obtained from current standard Data Book (S.D.B) CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 15 3.2.1 Fixing of Rate per Unit of an Item: LECTURE NOTES Estimation and Costing The rate per unit of an item includes first cost, freight, insurance and transportation charges. ii) Cost of labour: The exact number of labourers required for unit of work and the multiplied by the wages/ day to get of labour for unit item work. iii) Cost of equipment (T&P): Some works need special type of equipment, tools and plant. In such case, an amount of 1 to 2% of estimated cost is provided. iv) Overhead charges: To meet expenses of office rent, depreciation of equipment salaries of staff postage, lighting an amount of 4% of estimate estimate is required for studies of various aspects of work of project and for its administrative approval. It can decide, in case of commercial projects, whether the net income earned justifies the amount invested or not. The approximate estimate is accompanied by a report duely explaining necessity and utility of the project and with a site or layout plan. A percentage 5 to 10% is allowed for contingencies. The following are the meth-ods used for preparation of approximate estimates. a) Plinth area method b) Cubical contents methods c) Unit base method. a) Plinth area method by multiplying plinth area with plinth area rate. The area is obtained by multiplying plinth area method by multiplying plinth area method. length and breadth (outer dimensions of building). In fixing the plinth area rate, carefull observation and necessary enquiries are made in respect of quality and quantity aspect of materials and labour, type of foundation, hight of building, roof, wood work, fixtures, number of storeys etc., As per IS 3861-1966, the following areas include while calculating the plinth area of building. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Types of Estimates a) Area of walls at floor level. 16 2 b) Internal shafts of sanitary installations not exceeding 2.0m, lifts, airconditionsing ducts etc., c) Area of barsati at terrace level: Barsati means any covered space open on one side constructed on terraced roof which is used as shelter during rainy season. d) Porches of non cantilever type. Areas which are not to include a) Area of lofts. b) Unenclosed balconies. c) Architectural bands, cornices etc., d) Domes, towers projecting above terrace level. e) Box louvers and vertical sunbreakers. b) Cubical Contents Method: This method is generally used for multistoreyed buildings. It is more accurate that the other two methods viz., plinth area method and unit base method. The cost of a structure is calculated approximately as the total cubical contents (Volume of buildings) multiplied by Local Cubic Rate. The volume of building is obtained by Length x depth or height. The length and breadth are measured out to out of string course, cornice, carbelling etc., is neglected. The cost of building= volume of buildings x rate/ unit volume. c) Unit Base Method: According to this method the cost of structure is deter-mined by multiplying the total number of units with unit rate of each item. In case schools and colleges, the unit is 'one bed'. the unit rate is calculated by dividing the actual expenditure incured or cost of similar building in the nearby locality by the num-ber of units. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 17 Problems on Plinth Area of all building is 800 sqm. and from following data. i) Plinth area rate Rs. 4500 per sqm ii) Cost of water supply @7½% of cost of building. iii) Cost of Sanitary and Electrical installations each @ 7½% of cost of building cost. v) Cost of roads and lawns @5% of building cost. vi) Cost of P.S. and contingencies @4% of building cost. Determine the total cost of building project. Solution : Data given: 2 Plinth area = 800m . Plinth area = 800m . Cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of Sanitary and electrical installation @ 15% = 5,40,000 00 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 00 2,70,000 100 Add the cost of building = 800 x 4500 = Rs. 36,00,000 = 800 x 4500 = Rs. 36,000 = Rs. 36,00 of archetectural features @1% = 36,00,000 100 36,00,000 5 1,80,000 00 Add the cost of Roads Lawns @ 5% = 100 Add the Cost of P.S. and contingencies @ 4% = 00 100 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY Total Rs. Assume Add supervision charges 8% on overall cost 8 = 47,70,000 100 Grand Total Rs. CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Types of Estimates 18 Example 3.2 : The plinth area of an appartment is 500 sqm. Detemine the total cost of building from the following data: 3 a) Rate of construction = Rs.1230/-per m . b) The height of appartment = 16.25 m c) Water Supply, Sanitary and Electrical installations each at 6% of building cost. d) Architectural appearance @ 1% of building cost. e) Unforeseen item @2% of Building cost. f) P.S. and contingencies @4% of The Cost of building = cubic content x cubic rate = 500 ×16.25 ×1230 = Rs. 99,93,750/- b) Provision for water supply, sanitary and Electrical installations water supply and sanitation each @ 6% = - 100 i.e total percent = 3×6 = 18% building items @2% = Rs. 1,99,875/- e) P.S. and contingenies @4% = Rs. 3,99,750/Total Sundries Total cost of the building project = Grand Total CE2402 / ESTIMATION AND QUANTITY SURVEYING = Rs.1,25,00,000/- VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 19 Estimation and Costing Example 3.3: The plinth area and plinth area and plinth area rate of a residential building as-suming suitable provisions. Solution : Cost of building = 100 x 5000 = Rs.5,00,000 Cost of water supply and sanitary fittings @15% = 100 Cost of Electrification @7½% = Rs. 75,000 5,00,000 = Rs. 37,500 100 Cost of Roads & Lawns @5% = 5,00,000 Cost of P.S.& % = 100 5,00,000 = Rs. 25,000 100 = Rs. 25,000 Total Cost Rs. 6,57,500/Example 3.4 : Prepare an approximate Extimate of a proposed building from the following? Plinth area of the structure = 2500 per sqm. Water supply and sanitary arangements = 12½% Electrification = 7% Fluctuation of rates = 5% petty supervision charges = 3% sol: Cost of Building = 226x 2500 = Rs. 5,65,000 Water supply & Sanitory arrangements @ 12½ % 5,65,000 = Electrification @ 7% = 100 5,65,000 Hole CE2402 / ESTIMATION AND QUANTITY SURVEYING = Rs. 70,000 = Rs. 39,550 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 20 Types of Estimates Fluctuation of rates 5% = 100 Pettysupervision charges 3% = = Rs. 28,250 = Rs.16,950 100 Total Cost Rs. = 7,19,750.00 Problem on Cubical content Method: Example 3.5 : Prepare the rough estimate for a proposed commertial comples for a municipal corporation for the following data. 2 Plinth Area = 500m /floor Ht of each storey = 3.5m No.of storeys = G+2 3 Cubical content rate = Rs. 1000/m Provided for a following as a pecentage of structured cost a) water supply & Sanitary arrangement -8% b) Electrification -6% c) Fluctuation of rates - 5% d) Contractors profit - 10% e) Petty supervision & contingencies - 3% Sol : Cubical content = $52.5 \times 6/100 = 52.5 \times 6/100 =$ Rs.3.15 lakhs c) fluctuation of rates = $52.5 \times 5/100$ = Rs.2.625 Total = Rs. 9.975 Lakhs Structural cost = Rs. 52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = $62.475 \times 3/100$ e) Contractors Profit = 8.52.500 Lakhs d) P.S./& contingencies = 8.52.500 L VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 21 Problems on Unit Base Method: LECTURE NOTES Estimate of a hospital building for 50 beds. The cost of construction altogether for each bed is Rs. 60,000/-. Determine the total cost of hospital building. Solution: No. of beds = 50 Cost of construction = Rs. 60,000/Total Cost of Hospital building = 50x 60,000 = Rs. 30,00,000/Example 3.7: To prepare the rough cost estimate of a hostel building which accommodate 150 students. The cost of construction including all provisions is Rs. 15,000/- per student. Determine total cost of building. Solution : No.of students = 150 Cost of construction including all L.S. provisions = Rs. 15,000/-Total Cost of hostel building =150 x 15000 = Rs. 22,50,000/-(Rupees twenty two lakhs, fifty thousands only) EXERCISE I. SHORT ANSWER QUESTIONS: 1. List the factors to be consider while preparing detailed estimate and explain breifly? What are the differences between plinth area method and Unit base method? 3. List the requirements of data preparation. II ESSAY TYPE QUESTIONS : 1. Prepare the approximate cost of building project (group HOuseing) i) No.of houses = 150 2 ii) Plinth area of each dwelling = 600m 2 iii) Plinth area rate = Rs. 5,000/-per m iv) Cost of water supply & sanitary arrangements @12½% v) Electrification at 7½% of cost of builing. vi Cost of roads & Lawns @5% vii) Cost of P.S.& contingencies @4% 2. Prepare a rough cost estimate of a cinema theatre which accommodate 1700 seats. The cost of construction including all provisions is Rs.6000/- per seat. 3. What are the methods of preparation of approximate estimates and explain briefly. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 22 Chapter 4DETAIL & ABSTRACT ESTIMATES OF BUILDINGS Example 1: From the given figure below calculate the detailed and abstract estimate for the single roomed building (Load bearing type structure) by a) long wall & short wall method (b) Centre Line Method Note: All Dimensions are in 'M' Single Roomed Building (Load Bearing type structure) CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 23 Estimation and Costing a) Long walls - Short Wethod S.No. Particulars of Items No. 1. Earth Work excavation for foundation a) Long walls b) Short walls 2 2 2 2 L B H 2 2 Explanation 6.2 0.9 1.4 15.264 L=5.3+.45+.45=6.2 D= 0.3+0.5+0.6 = 1.4 3.4 0.9 1.4 8.568 L= 4.3-0.45-0.45= 3.4 Total 24.192 m 3 3.348 1.836 Total 5.184 m 6.2 0.9 0.3 3.4 0.9 0.3 5.9 0.6 0.5 3.7 0.6 0.5 Total b) Basement i) Long walls ii) Short walls Q 3.54 2.22 3 L= 5.3+0.3+0.3=5.9 L=4.3-0.3-0.3 = 3.7 5.76 m 3 3.105 L= 5.3+0.225+0.225= 5.75 2.079 L= 4.3-0.225-0.225= 5.75 2.079 L= 4.3-0.225-0.225= 5.75 2.079 L= 4.3-0.225-0.225= 5.75 2.079 L= 4.3-0.25-0.225= 5.75 2.079 L= 4.3-0.25-0.25= 5.75 2.079 L= 4.3-0.25= 5.75 2.079 =3.85 3 Total 5.184 m 5.75 0.45 0.6 3.85 0.45 0.6 Total R.R. Masonry for footings and Basement = 5.76+5.184 = 10.94 m 3 4. Brick masonary with CM (1:6) for super structure a) Long Walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15-0.15=4.0 b) Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 7.20 L=4.3-0.15+0.15=4.0 b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 5.6 0.30 a) Long Walls b) Short walls 2 5.6 0.30 a) L 2 2 5.6 0.2 0.75 4.4 0.2 0.75 1.68 1.32 Total 20.28 CE2402 / ESTIMATION AND OUANTITY SURVEYING 3 m VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 24 Detail & Abstract Estimates of Buildings S.No. Particulars of Items No. L Deductions for openings a)Doors 1 b) Windows 3 Net Brick Masonry 5. R.C.C. (1:2:4) for a) Roof slab b) Lintels over i) Doors ii) Windows c) Beams ii) short beams B H Q Explanation 1.0 0.3 2.1 0.63 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.202 2 2 5.6 0.3 0.3 1.008 4.0 0.3 0.3 0.720 Total 5.074 m 3 6. Sandfilling for 1 4.85 3.85 basement 7 C.C.(1:4:8) for 1 4.85 3.85 flooring 8 Flooring with Mosaic 1 5.0 4.0 tiles 9 Plastering with CM (1:6) for super structure Inside For walls 1 20.4 - Basement outside 1 21.6 - Parapet wall a) Inside 1 18.8 - b) top 1 19.6 0.2 0.48 8.96 0.1 1.86 L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 m2 - 20.0 3.0 54.0 L= 2(5.0+4.0) = 18 .0 3.87 61.2 L=2(5.6+4.6)=20.4 0.6 12.96 H=3.0+0.12+0.75=3.87 (upto parapet wall) 14.1 0.75 -- 3.92 Total 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows 3x2 1.5 -- 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for opeinings 4.2 Doors 1x2 1.0 -- 2.1 Windows VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 25 LECTURE NOTES Estimation and Costing S.No. Particulars of Items No. L 10 Plastering for walls and ceiling B H Q Explanation 5.0 4.0 -- 20.0 m2 151.18 (= 131.18+20= 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (=131.18+20)151.18) 1 No. 3No. 14 Painting with ready mixed synthetic enamil paits with two coats over primary coat for new wood for a) Doors 2¹/₄x1 1.0 --- 2.1 4.725 b) Windows 2¹/₄x3 1.5 --- 1.2 12.15 2 Total 16.875 m 15 Petty supervision and contingencies at 4% and rounding off. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 26 Detail & Abstract Estimates of Buildings b) Centre Line Method S.No. Particulars of Items No. L B Deductions for openings a) Doors b) Windows Net Brick Masony 5. R.C.C. (1:2:4) for a) roof slab b) Lintels over i) Doors ii) Windows c) beams 1 19.2 0.3 3.0 17.28 + 3.0- = m3 0.63 1.62 (-)2.25 m3 18.03 m 3 1 5.6 4.6 0.12 3.090 1 1.2 0.3 0.15 0.202 1 19.2 1.3 0.3 0.202 1 19.2 1.3 0.3 0.202 1 19.2 1.3 0.3 0.202 1 19.2 1.3 0.3 0.202 1 19.2 1.3 0.3 0.202 1 1 1.728 Total 5.074 m 3 6. Sandfilling for basement 7 C.C.(1:4:8) for flooring 1 4.85 3.85 0.48 8.96 1 4.85 3.85 0.1 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8.01 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES ESTIMATION AND PROVINCE AN flooring with Mosaic tiles 9 Plastering with CM (1:6) for super structure Inside For walls Out side For walls Out side For walls Basement outside Parapet wall a) Inside b) top 1 5.0 4.0 - 20.0 1 18.0 - 3.0 54.0 1 20.4 1 21.6 - 3.87 61.2 - 0.6 12.96 1 18.8 - 0.75 14.1 1 19.6 0.2 - 3.92 Total 146.18 Deductions for opeinings 1x 4.2 Doors 2 1.0 - 2.1 3x Windows 2 1.5 - 1.2 $10.8\ 15.0\ \text{Net Plastering} = 10\ \text{Plastering}\ \text{for Ceiling}\ 1\ \text{with CM}(1:5)\ 11\ \text{White Washing with two coats with Janatha cement Same as quantity of plastering}\ for walls\ and\ ceiling\ 146.18-15\ 5.0 = 4.0 - m\ 2\ L=5.0-0.075-0.075=3.85\ 2\ m\ 131.18\ m\ 2\ (131.18+20=151.18)\ 12.\ \text{Colour washing with two coats Same}\ \text{Same}\ \text{Same$ as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 m2 1 No. 3No. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 28 Detail & Abstract Estimates of Buildings S.No. Particulars of Items No. L B H Q 14 Painting with ready mixed synthetic enamil paints with two coats over primary coat for new wood for a) Doors 2¹/₄x3 1.5 --- 1.2 12.15 Total 16.875 Explanation m2 15 Petty supervision and contingencies at 4% and rounding off. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 29 Estimation and Costing Abstract estimate of single roomed building (load bearing structure) S.No. Description of item 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11 12 13 14 15 16 17 18 19 Earth work excaation Cement concrete(1:4:8) RR.masonry in C.M.(1:5) Sand filling in basement Brick masonry in country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for lintels, beams etc. R.C.C.(1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country wood for doors. Supplying and fixing of country wood for doors. C.M (1:5) White washing with best shell lime Flooring with spartek tiles set in C.M (1:3) Painting with ready mixed enamel paint Povision for electrification @7.5% Provision for architectural appearance @2% Provision for unforeseen items 2% Provision for P.s. and contingencies @4% m3 3 3 m 3 2 2 2 151.18 m 2 m2 2 16.875 m m 11963.52 18633.00 2700.72 3 3465.00 12420.00 8798.70 1753.68 8460.00 2 10094.50 2691.86 5383.73 Grand Total Rs. CE2402 / ESTIMATION AND QUANTITY SURVEYING 172279.65 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 30 Detail & Abstract Estimates of Buildings Example :2 :-From the given figure below calculate the details and abstract estimate for the double roomed building (Load bearing type structure) by a) long wall & short wall method (b) Centre Line Method Room1 4x6m Room2 3x6m CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 31 LECTURE NOTES Estimation and Costing S.No. Particulars of Items No. L B H Q Explanation 1. Earth Work excavation for foundation a) Long walls b) Short walls 2 3 8.6 1.0 1.05 18.05 L=7.6+0.5+0.5=86 5.3 1.0 11.05 16.70 L=6.3-0.5-0.5=5.3 Total 34.75 m3 2. C.C.(1:4:8) bed for foundation a) L=7.6+0.15+0.15=7.9 3.0 16.20 L=6.3-0.15-0.15=6.0 2 2 7.90 0.2 0.70 2.212 6.20 0.2 0.70 1.736 Total 60.11 3. Brick masanory for footing a) Long walls b) short walls ii) for base ment long walls short walls ii) for base ment long walls short walls ii) for super structure long walls short walls ii) for base ment long walls b) short wall 0.2 3.18 Total 6.62 m 3 6.6 0.2 a) long walls b) Shot walls Deductions for openings Doors 3 Windows 3 3 Net B.M.=60.11-377=56.34m 1.0 1.5 1.20 1.70 0.3 2.1 1.89 0.3 1.2 1.62 0.3 0.10 0.153 Total 3.771 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OFF ENGINEERING & TECHNOLOGY LECTURE NOTES 32 Detail & Abstract Estimates of Buildings 4 RCC(1:2:4) for a) roof slab 1 7.9 6.6 0.12 6.256 b) for lintles over doors 3 1.2 0.3 0.1 0.153 c) beams 1 33.8 0.3 0.3 3.042 3 Total 9.298 m 5. Plastering for walls 1 20.0 -3.0 60.00 L=2(4.0+6.0)=20 a) Inside room1 1 18.0 -3.0 54.00 room2 1 29.0 --3.0 87.00 L=2(7.9+6.6)=29 b) out side 1×2 28.2 --- 0.70 39.48 L=2(7.7+6.4)=28.2 Parapet wall(Sides) 1×1 28.2 0.20 -- 5.64 Total 23.4 m2 2 Net Plastering = 246.12 - 23.4 = 222.72 m 6. flooring with cuddapah slab in cm (1:3) Room1 1 4.0 room2 1 29.0 --- 3.0 87.00 L=2(7.9+6.6)=29 b) out side 1×2 28.2 --- 0.70 39.48 L=2(7.7+6.4)=28.2 Parapet wall(Sides) 1×1 28.2 0.20 --- 5.64 Total 23.4 m2 2 Net Plastering = 246.12 - 23.4 = 222.72 m 6. flooring with cuddapah slab in cm (1:3) Room1 1 4.0 room2 1 29.0 --- 3.0 87.00 L=2(7.9+6.6)=29 b) out side 1×2 28.2 --- 0.70 39.48 L=2(7.7+6.4)=28.2 Parapet wall(Sides) 1×1 28.2 0.20 --- 5.64 Total 23.4 m2 2 Net Plastering = 246.12 - 23.4 = 222.72 m 6. flooring with cuddapah slab in cm (1:3) Room1 1 4.0 room2 1 29.0 room2 1 2 6.0 --- 24 Room2 1 3.0 6.0 --- 18 Total 42 m 2 7 Plastering for ceiling = same as flooring 42 8 White washing = same as plastering for walls and ceiling 264.72 m 2 10 Supply & Fixing of best country wood for 3 a) Doors 3Nos. b) Windows 3 3 Nos 11 Painting with ready mixed synthetic enamil paints two coats over primary coat for new wood for a) Doors b) Windows 12 2% unforeseen items 13 2¹/₄x3 1.0 2¹/₄x3 1.5 --- 14.175 11.13 25.305 m 2 4% P.S& contingencies and round off. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 33 Estimation and Costing b) Centre Line Method S.No. Particulars of Items No. 4.3 L B H Q Explanation 2. C.C.(1:4:8) bed for foundation 3. Brick masonry with CM(1:4) a) for foundation i) first footing ii) 2nd footing b) for basement c) for super structure d) for parapet wall 7.9 1 33.1 1.0 1.05 34.75 L=34.1-0.4 x2/2 =28.2 Deductions for Openings Doors Windows Net B.M.=60.114. Quantity of R.C.C.Roof, 1 28.2 0.2 0.70 3.948 Total 60.10 3 3 3 1.0 1.5 1.2 1.7 3.771=56.34 m Plasterin g 0.3 0.3 0.3 2.1 1.2 0.1 0.1 Total m3 1.89 1.62 0.108 1.153 3.771 m 3 3 for walls flooring, White washing is same as method. and cealing and &Shor t wall Longwall CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Detail & Abstract estimates of Buildings 34 Abstract estimates at a Buildings 34 Abstra 17 18 Earth work excavation Cement concrete(1:4:8) Sand filling in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country wood for windows and ventilators. Plastering to all exposed surfaces of brick work and basement with C.M (1:5) White washing with best shell lime Flooring with spartek tiles set in C.M (1:3) Painting with ready mixed enamel paint Provision for water supply and sanitary arrangements @12.5% Provision for electrification @7.5% Provision for architectural appearance @2% Provision for unforeseen items 2% Provision for P.S.and contingencies @4% Quantity Unit 3 34.75 6.62 12.036 56.34 m 3.303 m 6.26 4.2 Rate Per Amount 3 465 1545 195.20 2291 10m 1615.90 3 1m 10228.00 3 m 129075.00 6030 m m 3 m 6030 1452 m 3 m 37748.00 6098.40 6.3 m 31650 m 2 10395.00 5.4 m 2300 m 582 10m 2 116 10m 2 4230 10m 2 17766.00 335 10m 2 8477.17 128090.00 m3 m33 m 3 3 2 2 222.72 m 2 264.72 m 42 2 m 25.305 m2 3 19918.00 3 2 12420.00 12962.30 3070.75 16011.25 9606.75 2561.80 5123.60 Grand Total CE2402 / ESTIMATION AND QUANTITY SURVEYING 163955.23 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS LECTURE NOTES V SEM/III YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Estimating is the technique of calculating or Computing the various quantities and the expected Expenditure to be incurred on a particular work or project. In case the funds avilable are less than the estimated cost the work is done in part or by reducing it or specifications are altered, the following require-ment are necessary for preparing an estimate. a) Drawings like plan, elevation and sections of important points. b) Detailed specifications about workmenship & properties of materials etc. c) Standard schedule of rates of the cost of the work and hence its feasibility can be determined i... e whether the project could be taken up with in the funds available or not. 2. Estimate gives an idea of time required to control the expenditure during the execution of work. Estimate is also required to control the expenditure during the execution of work. OF ESTIMATING OR METHOD OF ESTIMATING. 1. 2. 3. Estimating involves the following operations. Rates. CE2402 / DATA REQUIRED TO PREPARE AN ESTIMATE 1. 2. 3. Drawings i.e. plans, elevations, sections etc. Specifications. Rates. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Introduction to the Subject 2 1.4.1 DRAWINGS If the drawings are not clear and without complete dimensions the prepa-ration of estimation become very difficult. So, It is very essential before preparing an estimate. 1.4.2. SPECIFICATIONS a) General Specifications: This gives the nature, quality, class and work and materials in general idea of building. b) Detailed Specifications: These gives the detailed description of the vari-ous items of work laying down the Quantities and qualities of materials, their proportions, the method of preparation workmanship and execution of work. 1.4.3. RATES: For preparing the estimate the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item. 2. The rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are re-quired. 1. For arriving at the unit rates of each item of work are skilled or unskilled of masons, carpenters, Mazdoor, etc., 1.5 COMPLETE ESTIMATE: Most of people think that the estimate of a structure includes cost of land, cost of land, cost of land, cost of materials and labour, But many other direct and indirect costs included The Complete Estimate and is shown below. Cost of land, cost of materials and labour, But many other direct and indirect costs included The Complete Estimate and is shown below. owner and contractor Cost of Structure Actual Cost of Structure Actual Cost of Structure Actual Cost of Permit fees for Verification if any labour constrution water, of deeds and electricity from execution of concerned autorities deeds cost of Consulting materials Engineers fees cost of Consulting materials Engineers fees cost of Structure Actual Cost of Structure Actu AND QUANTITY SURVEYING Cost of supervision VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 3 LECTURE NOTES Estimation and Costing 1.6 LUMPSUM: While preparing an estimate, it is not possible to workout in detail in case of petty items. Items other than civil engineering such items are called lumpsum items or simply L.S.Items. The following are some of L.S. Items in the estimate. 1. Water supply and sanitary arrangements. 2. Electrical installations like meter, motor, etc., 3. Architectural features. 4. Contingencies and unforeseen items. Ingeneral, certain percentage on the cost of estimation is alloted for the above L.S.Items Even if subestimates prepared or at the end of execution of work, the actual cost should not exceed the L.S.amounts provided in the main estimate. 1.7 WORK CHARGED ESTABLISHMENT: During the construction of a project considerable number of skilled su-pervisors, work assistance, watch men etc., are employed on temporary basis. The salaries of these persons are drawn from the L.S. amount alloted towards the work charged establishment. that is, establishment which is charged directly to work. an L.S.amount of 1¹/₂ to 2% of the estimated cost is provided towards the work charged establishment. EXERCISE Short Answer Questions 1. State the requirements of an estimate? estimation? 3. What is work charged establishment? CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 4 Chapter 2 MEASUREMENT OF MATERIALS AND WORKS 2.1 UNITS OF MEASUREMENTS: The units of measurements are mainly categorised for their nature, shape and size and for making payments to the contractor and also. The principle of units of measurements involve length like doors, windows, trusses etc., are expressed in numbers. b) Works consists the following: a) Single units work like doors, windows, trusses etc., are expressed in numbers. b) Works consists the following: a) Single units work like doors, windows, trusses etc., are expressed in numbers. b) Works consists linear measurements involve length like cornice, fencing, hand rail, bands of specified width etc., are expressed in running metres (RM) c) Works consists areal surface measurements involve area like plastering, white washing, partitions of specified thickness 2 etc., are expressed in Square meters (m) d) Works consists cubical contents which involve volume like earth work, cement concrete, Masonry etc are expressed in Cubic metres. [BASED ON IS 1200 REVISED] Sl. No. I II Particulas of item Earth work in Excavation 2. Earth work in filling in plinth Concrete in Lintels 3. R.C.C. in slab 4. C.C. or R.C.C. Chujja, Sunshade 5. L.C. in roof terracing (thickness specified) Width & Hight Damp ProofCource (D.P.C) (Thickness should be mentioned) Brick work in foundation 2. Brick work in glinth 3. Brick work in arches 6. Reinforced brick work (R.B.Work) Stone Work: Stone masonry Wood work: 1. Door sand windows frames or chowkhats, rafters beams 2. Shutters of doors and windows (thickness specified) 3. Doors and windows fittings (like hinges, tower bolts, kandles) Steel work 1. Steel reinforcement 3. Rivets, bolts, & nuts, Anchor bolts, Lewis bolts, Holding down bolts. 4. Iron hold fasts 5 Iron railing (height and types specified) 6. Iron grills LECTURE NOTES Estimation and Costing cum percum percum percum percum percum cum percum cum percum cum percum sqm persqm cum percum sqm persqm cum cum percum sqm pers quintal per quintal sqm per sqm CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 6 Measurement of Materials and Works VIII IX X XI XII XIII XIV Roofing 1. R.C.C. and R.B.Slab roof (excluding steel) 2. L.C. roof over and inclusive of tiles or brick or stone slab etc (thickness specified) 3. Centering and shuttering form work 4. A.C.Sheet roofing Plastering, points&finishing 1. Plastering-Cement or Lime Mortar (thickness and proportion specified) 2. Pointing 3. White washing, colour washing, cement wash (number of coats specified) 4. Distempering (number of coats specified) 5. Painting, varnishing (number of coats specified) Flooring 1. 25mm cement concrete floor (including L.C.) 2. 25mm or 40mm C.C. floor 3. Doors and window sills (C.C. or cement mortar plain) Rain water pipe /Plain pipe Steel wooden trusses Glass pannels (supply) Fixing of glass panels or cleaning cum per cum sqm per sqm sqm pe LECTURE NOTES Estimation and Costing The rules for measurement of each item are invaribly described in IS-1200. However some of the general rules are listed below. 1. Measurement shall be made for finished item of work and description of each item shall be made for finished item of work and lescription of each item are invaribly described in IS-1200. the work in required shape, size and specification. 2. In booking, the order shall be in sequence of length, breadth and height or thickness. 3. All works shall be measured to the nearest 0.01m. ii) Areas shall be measured to the nearest 0.01 sq contents shall be worked-out to the nearest 0.01 cum 4. Same type of work under different conditions and nature shall be measured separately under separately under separately under separately under different conditions. The bill of quantities shall fully describe the materials, proportions, workmanships and accurately under separately under sep structural concrete, the categories shall be measured separately and the heights shall be described: a) from foundation to plinth level b) from plinth level b) from plinth level b) from plinth and super structure etc., canbe workout by any of following two methods: a) Long wall - short wall method b) Centre line and short wall method. c) Partly centre line CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Measurement of Materials and Works 8 length of long wall, (out to out) may be calculated after adding half breadth at each end to its centre line length. Thus the length of short wall measured into in and may be found by deducting half breadth from its centre line length at each end. The length of long wall usually decreases from earth work to brick work in super structure while the short wall increases. These lengths are multiplied by breadth and depth to get quantities. b) Centre line method: This method is suitable for walls of similar cross sections. Here the total quantity at a time. When cross walls or partitions or verandah walls join with mainall, the centre line length gets reduced by half of breadth for each junction. such junction or joints are studied caefully while calculating total centre line length. The estimates prepared by this method is adopted when external (i.e., alround the building) wall is of one thickness and the internal walls having different thicknesses. In such cases, centre line method is applied to external walls and long wallshort wall method is used to internal walls. This method suits for different thicknesses walls and different level of foundations. Because of this reason, all Engineering departments are practicing this method. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 9 Estimation and Costing P.B.-1: From the Drawing given below determine (a) Earth work exca-vation (b) CC (1:5:10) Bed (c) R.R.Masonry in C.M. (1:6) (d) Brick Work in C.M.(1:6). Single Roomed Building (Load Bearing type structure) Note: All Dimensions are in 'M' CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 10 Measurement of Materials and Works Long walls 2 L B H Q Explanation 6.2 0.9 1.4 15.264 L=5.3+.45+.45 = 6.2 D= 0.3+0.5+0.6 = 1.4 3.4 0.9 1.4 8.568 L= 4.3-0.45-0.45= 3.4 Total 24.192 m 2. C.C.(1:4:8) bed for foundation a) Long walls 2 b) Short walls 2 6.2 0.9 0.3 3.48 1.836 Total 5.184 m 3. R.R.Masonry in CM (1:6) for a) Footings i) Long walls 2 ii) Short walls 2 5.9 0.6 0.5 3.7 0.6 0.5 3.7 0.6 0.5 3.54 Long Wall 2 5.6 0.30 3.00 10.08 L=5.3+0.15+0.15=5.6 b) Short walls 2 4.0 0.30 3.00 7.20 L=4.3-0.15-0.15=4.0 m3 Total 17.28 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 11 Centre Line Method S.No. Particulars of Items No. 1. Earth Work excavation for foundation 1 5.3 LECTURE NOTES Estimation and Costing L B H Q Explanation 3 19.2 0.9 1.4 24.192 m L=2(5.3+4.3)=19.2 4.3 2. C.C.(1:4:8) bed for 1 foundation 3. R.R.Masonry in CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 4. Brick masany with CM (1:6) for a) Footings 1 b) Basement 1 b) Baseme m 19.2 0.3 0.3 17.28 CE2402 / ESTIMATION AND QUANTITY SURVEYING m3 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 12 Measurement of Materials and Works EXERCISE I. Short Answer Questions 1. List the difference between centre line method and long wall-short wall method of taking out measurements. 2. What are the rules to be followed while taking the mesurements? 3. Mension the units for the following items. a) flooring b) R.R.Masonry c) Plastering for pointing d) Damp proof course e) R.C. sunshade (Sepcified width and thickness) II. Essay type questions 1. From the Drawing given below determine (a) Earth work excavation (b) CC (1:5:10) Bed (c) R.R.Masonry in C.M. (1:6) (d) Brick Work in C.M.(1:6). by (a) longwall - short wall method (b) Centre line Method CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 13 LECTURE NOTES Estimation and Costing Chapter 3 TYPES OF ESTIMATES 3.1 DETAILED ESTIMATE: The preparation of detailed estimate consists of working out quantities of various items of work and then determine the cost of each item. This is prepared in two stages. i) Details of measurements and calculation of quantities: The complete work is divided into various items of work such as earth work concreting, brick work, R.C.C. Plastering etc., The details of measure-ments are taken from drawings and entered in respective columns of prescribed proforma. the quantities are calculated by multiplying the values that are in num-bers column to Depth columns of prescribed proforma. Quantity Explanatory of Item Notes m m (D/H)m ii) Abstract of Estimated Cost : The cost of each item of work is worked out from the quantities that already computed in the prescribed form is known as abstract of estimated Cost is allowed for Petty Supervision, contingencies and Unforeseen items. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 14 Types of Estimates ABSTRACT OF ESTIMATE FORM Item No. Description/ Quantity Unit Particulars Rate Per (Unit) Amount The detailed estimate should accompained with i) Report ii) Specification iii) Drawings (plans, elevation, sections) iv) Design charts and calculations v) Standard schedule of rates. 3.1.1.Factors to be consistered While Preparing Detailed Esti-mate: i) Quantity and transportation of materials: For bigger project, the re-guirement of materials is more. such bulk volume of mateials will be pur-chased and transported definitely at cheaper rate. ii) Location of site: The site of work is selected, such that it should reduce damage or in transit during loading, stocking of mateirals. iii) Local labour charges: The skill, suitability and wages of local laboures are consideed while preparing the detailed estimate. 3.2 DATA: The process of working out the cost or rate per unit of each item is called as Data. In preparation of Data, the rates of materials and labour required for one unit of item are taken from Standard Data Book (S.D.B) CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 15 3.2.1 Fixing of Rate per unit of an item includes the following: 1) Quantity of materials & cost: The requirement of materials are taken strictly in accordance with standard data book(S.D.B). The cost of these includes first cost, freight, insurance and transportation charges. ii) Cost of labour: The exact number of labour for unit item work. iii) Cost of labour: The exact number of labour: The exact tools and plant. In such case, an amount of 1 to 2% of estimated cost is provided. iv) Overhead charges: To meet expenses of office rent, depreciation of equipment salaries of staff postage, lighting an amount of 4% of estimate estimate is required for studies of various aspects of work of project and for its administrative approval. It can decide, in case of commercial projects, whether the net income earned justifies the amount invested or not. The approximate estimate is accompanied by a report duely explaining necessity and utility of the project and with a site or layout plan. A percentage 5 to 10% is allowed for contingencies. The following are the methods c) Unit base method. a) Plinth area method b) Cubical contents methods c) Unit base method. multiplying plinth area with plinth area rate. The area is obtained by multiplying length and breadth (outer dimensions of building). In fixing the plinth area rate, carefull observation and necessary enquiries are made in respect of guality and guantity aspect of materials and labour, type of foundation, hight of building, roof, wood work, fixtures, number of storeys etc., As per IS 3861-1966, the following areas include while calculating the plinth area of building. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Types of Estimates a) Area of walls at floor level. 16 2 b) Internal shafts of sanitary installations not exceeding 2.0m, lifts, airconditionsing ducts etc., c) Area of barsati at terrace level: Barsati means any covered space open on one side constructed on terraced roof which is used as shelter during rainy season. d) Porches of non cantilever type. Areas which are not to include a) Area of lofts. b) Unenclosed balconies. c) Architectural bands, cornices etc., d) Domes, towers projecting above terrace level. e) Box louvers and vertical sunbreakers. b) Cubical Contents Method: This method is generally used for multistoreyed buildings. It is more accurate that the other two methods viz., plinth area method and unit base method. The cost of a structure is calculated approximately as the total cubical contents (Volume of buildings) multiplied by Local Cubic Rate. The volume of building is obtained by Length and breadth are measured out to out of walls excluding the plinth off set. The cost of string course, cornice, carbelling etc., is neglected. The cost of building= volume of buildings x rate/ unit volume. c) Unit Base Method: According to this method the cost of structure is deter-mined by multiplying the total number of units with unit rate of each item. In case schools and colleges, the unit considered to be as 'one student' and in case of hospital, the unit rate is calculated by dividing the actual expenditure incured or cost of similar building in the nearby locality by the num-ber of units. CE2402 / ESTIMATION AND OUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 17 Problems on Plinth Area Method LECTURE NOTES Estimation and Costing Example 3.1: Prepare an approximate estimate of building project with total plinth area of all building is 800 sqm. and from following data. i) Plinth area rate Rs. 4500 per sqm ii) Cost of sanitary and Electrical installations each @ 7½% of cost of building. iii) Cost of sanitary and Electrical installations each @ 7½% of cost of building. and lawns @5% of building cost. vi) Cost of P.S. and contingencies @4% of building cost. Determine the total cost of building project. Solution : Data given: 2 Plinth area = 800m . Plinth area rate = Rs. 4500 per Sqm. ... Cost of building = 800 x 4500 = Rs. 36,00,000=00 Add the cost of the water supply charges @7½% 36,00,000 = 00 2,70,000 100 Add the Cost of Sanitary and electrical installation @ 15% = 5,40,000 00 100 Add the cost of Roads Lawns @ 5%= 100 Add the Cost of P.S. and contingencies @ 4% = 00 100 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY Total Rs. CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES 47,70,000 =00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000 =00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 47,70,000=00 3,81,600 00 51,51,600=00 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE N NOTES Types of Estimates 18 Example 3.2 : The plinth area of an appartment is 500 sqm. Detemine the total cost of building from the following data: 3 a) Rate of construction = Rs.1230/--per m . b) The height of appartment = 16.25 m c) Water Supply, Sanitary and Electrical installations each at 6% of building cost. d) Architectural appearance @ 1% of building cost. e) Unforeseen item @2% of Building cost. f) P.S. and contingencies @4% of building. Solution : a) The Cost of building = cubic content x cubic rate = $500 \times 16.25 \times 1230 = \text{Rs}$. 99,93,750/- b) Provision for water supply, sanitary and Electrical installations water supply and sanitation each @ 6% = -100 i.e total percent = $3\times 6 = 18\%$ building cost c) Architectural appearance @1% = 99,93,750 = Rs. 99,937/- 100 d) Unforeseen items @2% = Rs. 1,99,875/- e) P.S. and contingenies @4% = Rs. 1,99,87 water supply and sanitary fittings @15% = 100 Cost of Electrification @7½% = = Rs. 75.000 5.00.000 = Rs. 27.500 100 Cost of P.S.& % = 100 5.00.000 = Rs. 25.000 Total Cost Rs. 6.57.500/Example 3.4 : Prepare an approximate Extimate of a proposed building from the follwoing? Plinth area of the building = 226 sqm. Cost of the structure = 2500 per sqm. Water supply and sanitary arangements = $12\frac{1}{2}\%$ Electrification = 7% Fluctuation of rates = 5% petty supervision charges = 3% sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply & Sanitory arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply & Sanitory arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply and sanitary arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply and sanitary arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply and sanitary arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply and sanitary arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply and sanitary arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol: Cost of Building = 226x 2500 = Rs.5,65,000 Water supply arrangements = $12\frac{1}{2}\%$ Sol = 100 5,65,000 100 CE2402 / ESTIMATION AND QUANTITY SURVEYING = Rs. 70,000 = Rs. 39,550 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 20 Types of Estimates Fluctuation of rates 5% = 100 Pettysupervision charges 3% = = Rs. 28,250 = Rs.16,950 100 Total Cost Rs. = 7,19,750.00 Problem on Cubical content Method: Example 3.5 : Prepare the rough estimate for a proposed commertial comples for a municipal corporation for the following data. 2 Plinth Area = 500m /floor Ht of each storey = 3.5m No.of storeys = G+2 3 Cubical content rate = Rs. 1000/m Provided for a following as a pecentage of structured cost a) water supply & Sanitary arrangement -8% b) Electrification -6% c) Fluctuation of rates - 5% d) Contractors profit - 10% e) Petty supervision & contingencies - 3% Sol : Cubical content x cubical content x cubical content rate = 5250 x 1000 = 52.5 Lakhs other provisions:a) Water supply and sanitation = $52.5 \times 8/100 = \text{Rs}.42$ Lakhs b) Electrification = $52.5 \times 6/100 = \text{Rs}.3.15$ lakhs c) fluctuation of rates = $52.5 \times 5/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. 9.975 Lakhs d) P.S./& contingencies = $62.475 \times 3/100 = \text{Rs}.2625$ Total = Rs. $9.975 \times 3/100 = \text{Rs}.$ AND QUANTITY SURVEYING = Rs.1.874 Lakhs = Rs.6.247 Lakhs = Rs.70.596 Lakhs VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 21 Problems on Unit Base Method: LECTURE NOTES Estimation and Costing Example 3.6: Prepare an approximate estimate of a hospital building for 50 beds. The

cost of construction altogether for each bed is Rs. 60,000/-. Determine the total cost of hospital building. Solution: No. of beds = 50 Cost of construction = Rs. 60,000/Total Cost of Hospital building = 50x 60,000 = Rs. 30,00,000/Example 3.7: To prepare the rough cost estimate of a hostel building which accommodate 150 students. The cost of construction including all provisions is Rs. 15,000/- per student. Determine total cost of building. Solution : No.of students = 150 Cost of construction including all L.S. provisions = Rs. 15,000/- Total Cost of hostel building. Solution : No.of students = 150 Cost of construction including all L.S. provisions = Rs. 15,000/- Total Cost of hostel building. List the factors to be consider while preparing detailed estimate and explain breifly? 2. What are the differences between plinth area method and Unit base method? 3. List the requirements of data preparation. II ESSAY TYPE QUESTIONS : 1. Prepare the approximate cost of building project (group HOuseing) i) No.of houses = 150 2 ii) Plinth area of each dwelling = 600m 2 iii) Plinth area rate = Rs. 5,000/-per m iv) Cost of vater supply & sanitary arrangements @12½% v) Electrification at 7½% of cost of builing. vi Cost of roads & Lawns @5% vii) Cost of P.S.& contingencies @4% 2. Prepare a rough cost estimate of a cinema theatre which accommodate 1700 seats. The cost of construction including all provisions is Rs.6000/- per seat. 3. What are the methods of preparation of approximate estimates and explain briefly. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 22 Chapter 4DETAIL & ABSTRACT ESTIMATES OF BUILDINGS Example 1: From the given figure below calculate the detailed and abstract estimate for the single roomed building (Load bearing type structure) by a) long wall & short wall method (b) Centre Line Method Note: All Dimensions are in 'M' Single Roomed Building (Load Bearing type structure) CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 23 Estimation and Costing a) Long walls b) Short walls 2 2 2. C.C.(1:4:8) bed for foundation a) Long walls b) Short walls 3. R.R.Masonry in CM (1:6) for a) Footings i) Long walls ii) Short walls 2 2 2 2 L B H 2 2 Explanation 6.2 0.9 1.4 15.264 L=5.3+.45+.45 = 6.2 D = 0.3+0.5+0.6 = 1.4 3.4 0.9 0.3 5.9 0.6 0.5 3.7 0.6 0.5 Total b) Basement i) Long walls ii) Short walls Q 3.54 2.22 3 L= 5.3+0.3+0.3=5.9 L=4.3 + 0.5 $0.3-0.3 = 3.75.76 \text{ m} 33.105 \text{ L} = 5.3+0.225+0.225 = 5.752.079 \text{ L} = 4.3-0.225-0.225 = 3.853 \text{ Total} 5.184 \text{ m} 5.750.450.6 \text{ A} 3.850.450.6 \text{ Total} 8.850.450.6 \text$ Short walls 2 4.0 0.30 3.00 c) for parapetwall 5.6 4.6 0.2 a) Long Walls b) Short walls 2 2 5.6 0.2 0.75 4.4 0.2 0.75 1.68 1.32 Total 20.28 CE2402 / ESTIMATION AND QUANTITY SURVEYING 3 m VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 24 Detail & Abstract Estimates of Buildings S.No. Particulars of Items No. L Deductions for openings a) Doors 1 b) Windows 3 Net Brick Masonry 5. R.C.C. (1:2:4) for a) Roof slab b) Lintels over i) Doors ii) Windows c) Beams ii) short beams B H Q Explanation 1.0 0.3 2.1 0.63 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.62 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 1.6 3 Total (-)2.25 m = 20.28 - 2.25 = 18.03 m 3 1 5.6 4.6 0.12 3.090 1 3 1.2 0.3 0.15 0.054 1.5 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.15 0.3 1.2 0.3 0.3 1.2 0.3 0.3 1.2 0.3 0.3 1.3 0.3 1.3 0.3 1.3 0.3 1.3 0.3 1.3 0.3 1.3 0.3 1.3 1.3 0.3 1.3 1.3 1.3 0.3 1.3 1.3 0.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1 0.15 0.202 2 2 5.6 0.3 0.3 1.008 4.0 0.3 0.3 1.008 4.0 0.3 0.3 0.720 Total 5.074 m 3 6. Sandfilling for 1 4.85 3.85 flooring 8 Floor 0.48 8.96 0.1 1.86 L = 5.0 - 0.075 - 0.075 = 4.85 B = 4.0 - 0.075 - 0.075 = 3.85 m2 - 20.0 3.0 54.0 L = 2(5.0 + 4.0) = 18.0 3.87 61.2 L = 2(5.0 + 4.6) = 20.4 0.6 12.96 H = 3.0 + 0.12 + 0.75 = 3.87 (upto parapet wall) 14.1 0.75 - 3.92 Total 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 - 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 - 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4.2 Doors 1x2 1.0 - 2.1 Windows 3x2 1.5 - 1.2 10.8 15.0 m 2 2 Net Plastering = 146.18 m2 Deductions for openings 4= 131.18 m CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 25 LECTURE NOTES Estimation and Costing S.No. Particulars of Items No. L 10 Plastering for Ceiling with CM(1:5) 1 11 White Washing with two coats with Janatha cement Same as quantity of plastering for walls and ceiling B H Q Explanation 5.0 4.0 -- 20.0 m2 151.18 (= 131.18+20= 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 (= 131.18+20) 151.18 coats over primary coat for new wood for a) Doors 2¹/₄x1 1.0 --- 2.1 4.725 b) Windows 2¹/₄x3 1.5 --- 1.2 12.15 2 Total 16.875 m 15 Petty supervision and contingencies at 4% and rounding off. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 26 Detail & Abstract Estimates of Buildings b) Centre Line Method S.No. Particulars of Items No. L B H Q Explanation 1 19.2 0.9 1.4 24.192 m 3 5.3 L=2(5.3+4.3)=19.2 4.3 3 2. C.C.(1:4:8) bed for foundation 1 19.2 0.45 0.6 b) Basement 1 19.2 0.45 b) Basement 1 19.2 b) Basement 1 5.184 Total 10.944 4. Brick masonry with CM (1:6) for super structure For parapet wall Deductions for openings a) Doors b) Windows c) beams 1 19.2 0.3 3.0 17.28 1 20.0 0.2 0.75 3.00 1 1.0 0.3 2.1 3 1.5 0.3 1.2 Total 2.25 = 17.28 + 3.0- = m3 0.63 1.62 (-)2.25 (-)2.25 m3 0.63 1.62 (-)2.25 (18.03 m 3 1 5.6 4.6 0.12 3.090 1 1.2 0.3 0.15 0.054 3 1.5 0.3 0.15 0.202 1 19.2 1.3 0.3 1.728 Total 5.074 m 3 6. Sandfilling for basement 7 C.C.(1:4:8) for flooring 1 4.85 3.85 0.1 1.86 CE2402 / ESTIMATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=3.85 VII SEM/IV YEAR SRI VIDYA COLLEGINATION AND QUANTITY SURVEYING L=5.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=4.85 B= 4.0-0.075-0.075=4.075 OF ENGINEERING & TECHNOLOGY 27 LECTURE NOTES Estimation and Costing 8. flooring with Mosaic tiles 9 Plastering with CM (1:6) for super structure Inside For walls Out side For walls Out side For walls 0.4 - 20.0 1 18.0 - 3.0 54.0 1 20.4 1 21.6 - 3.87 61.2 - 0.6 12.96 1 18.8 - 0.75 14.1 1 19.6 0.2 - 3.92 Total 146.18 Deductions for opeinings 1x 4.2 Doors 2 1.0 -- 2.1 3x Windows 2 1.5 -- 1.2 10.8 15.0 Net Plastering for Ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing with two coats with Janatha cement Same as guantity of plastering for ceiling 1 with CM(1:5) 11 White Washing Wa m2 20.0 m2 151.18 m 2 (131.18+20=151.18) 12. Colour washing with two coats Same as quantity of plastering for walls and ceiling 13 Supply & Fixing of best country wood for a) Doors 1 b) Windows 3 151.18 m2 1 No. 3No. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 28 Detail & Abstract Estimates of Buildings S.No. Particulars of Items No. L B H Q 14 Painting with ready mixed synthetic enamil paints with two coats over primary coat for new wood for a) Doors 2¹/₄x1 1.0 --- 2.1 4.725 b) Windows 2¹/₄x3 1.5 --- 1.2 12.15 Total 16.875 Explanation m2 15 Petty supervision and contingencies at 4% and rounding off. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 29 Estimation and Costing Abstract estimate of single roomed building (load bearing structure) S.No. Description of item 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11 12 13 14 15 16 17 18 19 Earth work excaation Cement concrete(1:4:8) RR.masonry in C.M.(1:5) Sand filling in basement Brick masonry in country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country wood for doors. Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country wood for doors. Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing of country bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and f wood for windows and ventilators. Plastering to all exposed surfaces of brick work and basement with C.M (1:5) White washing with best shell lime Flooring with ready mixed enamel paint Povision for water supply and sanitary arangements @12.5% Provision for electrification @7.5% Povision for sevent with c.m. (1:3) Painting with ready mixed enamel paint Povision for water supply and sanitary arangements @12.5% Provision for electrification @7.5% Povision for electrification @7.5% Povision for electrification @7.5% Povision for electrification @7.5% Povision for water supply and sanitary arangements @12.5% Provision for electrification @7.5% Povision for electrification @7.5% architectural appearance @2% Provision for unforeseen items 2% Provision for P.s.and contingencies @4% Quantity Unit 3 24.192 5.184 10.94 8.96 18.03 m 15217.50 3 10m 175.00 3 m 41306.73 6030 m 3 6030 1452 m 3 1650 m 2 2300 m 2 2 m 2 582 10m 2 151.18 m 116 10m 2 20 4230 10m 2 335 10m 565.31 Total 134593.46 16824.18 m 33 m 3 2 2 2 151.18 m 2 m 2 3 3465.00 12420.00 8798.70 1753.68 8460.00 2 10094.50 2691.86 5383.73 Grand Total Rs. CE2402 / ESTIMATION AND QUANTITY SURVEYING 172279.65 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 30 Detail & Abstract Estimates of Buildings Example :2 :- From the given figure below calculate the details and abstract estimate for the double roomed building (Load bearing type structure) by a) long wall & short wall method (b) Centre Line Method Room1 4x6m Room2 3x6m CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY 31 LECTURE NOTES Estimation and Costing S.No. Particulars of Items No. L B H Q Explanation 1. Earth Work excavation for foundation a) Long walls b) Short walls 2 3 8.6 1.0 1.05 18.05 0.4 0.4 2.560 L=7.6+0.2+0.0=8.0 0.4 2.832 L=6.3-0.2-0.2= 5.9 2 3 7.90 0.3 6.00 0.3 3.0 14.22 L=7.6+0.15+0.15=7.9 3.0 16.20 L=6.3-0.15-0.15=6.0 2 2 7.90 0.2 0.70 1.736 Total 60.11 3. Brick masanory for footings with CM (1:4) first footing a) Longwalls b) Short walls control of the control of long walls short walls iii) for super structure long walls iii) for super structure long walls short walls iv) Parapet wall 7.9 0.2 3.44 0.2 3.18 Total 6.62 m 3 6.6 0.2 a) long walls b) Shot walls Deductions for openings Doors 3 Windows 3 3 Net B.M.=60.11-377=56.34m 1.0 1.5 1.20 1.70 0.3 2.1 1.89 0.3 1.2 1.62 0.3 0.10 0.108 0.3 0.10 0.153 Total 3.771 CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 32 Detail & Abstract Estimates of Buildings 4 RCC(1:2:4) for a) roof slab 1 7.9 6.6 0.12 6.256 b) for lintles over doors 3 1.2 0.3 0.1 0.108 Windows 3 1.7 0.3 0.1 0.153 c) beams 1 33.8 0.3 0.3 3.042 3 Total 9.298 m 5. Plastering for walls 1 20.0 -3.0 60.00 L=2(4.0+6.0)=20 a) Inside room1 1 18.0 --3.0 54.00 room2 1 29.0 --3.0 87.00 L=2(7.9+6.6)=29 b) out side 1×2 28.2 -- 0.70 39.48 L=2(7.7+6.4)=28.2 Parapet wall(Sides) 1×1 28.2 0.20 -- 5.64 Total 246.12 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.0 -- 2.10 12.6 b) windows 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a) doors 3×2 1.5 1.20 10.8 Total 23.4 m 2 Deductions a 2 Net Plastering = 246.12- 23.4 = 222.72 m 6. flooring with cuddapah slab in cm (1:3) Room1 1 4.0 6.0 --- 24 Room2 1 3.0 6.0 --- 18 Total 42 m 2 7 Plastering for walls & Ceiling = same as plastering for walls are called a starting for ceiling = same as plastering for walls are called a starting for walls are called a starting for ceiling = same as plastering for walls are called a starting for wall a starting f and ceiling 264.72 m 2 10 Supply & Fixing of best country wood for 3 a) Doors 3Nos. b) Windows 3 3 Nos 11 Painting with ready mixed synthetic enamil paints two coats over primary coat for new wood for a) Doors b) Windows 12 2% unforeseen items 13 2¼x3 1.0 2¼x3 1.5 --- 14.175 11.13 25.305 m 2 4% P.S& contingencies and round off. CE2402 ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 33 Estimation and Costing b) Centre Line Method S.No. Particulars of Items No. 4.3 L B H Q Explanation 3.3 6.3 Total centre line length = (4.3+3.3)2+6.3x3=34.1m 1. Earth work excavation 2. C.C.(1:4:8) bed for foundation 3. Brick masonry with CM(1:4) a) for foundation i) first footing ii) 2nd footing b) for basement c) for super structure d) for parapet wall 7.9 1 33.1 1.0 1.05 34.75 L=34.1-2x1/2=33.1 1 33.25 0.85 33.50 0.60 33.7 0.40 33.80 0.30 0.40 0.45 0.40 3.0 11.30 9.045 5.392 30.42 L=34.1-0.65 x2/2 L=34.1-0.4 x2/2 L=34.1-0.3x2/2 77 6.6 6.4 0.2 Total centre line length = 2(7.7+6.4) = 28.2 Deductions for Openings Doors windows Lintels Doors Windows Net B.M.=60.114. Quantity of R.C.C.Roof, 1 28.2 0.2 0.70 3.948 Total 60.10 3 3 3 1.0 1.5 1.2 1.7 3.771=56.34 m Plasterin g 0.3 0.3 0.3 0.3 2.1 1.2 0.1 0.1 Total m3 1.89 1.62 0.108 1.153 3.771 m 3 3 for walls flooring, White washing is same as method. and cealing and &Shor t wall Longwall CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Detail & Abstract Estimates of Buildings 34 Abstract estimate of two roomed building (Load bearing type structure) S.No. Description of item 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11 12 13 14 15 16 17 18 Earth work excavation Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. (1:2:4) for slabs, Cement concrete (1:5:10) for flooring Supplying and fixing in basement Brick masonry in country Bricks of standard size in CM(1:8) R.C.C. 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Plastering to all exposed surfaces of brick work and basement with Spartek tiles set in C.M (1:3) Painting with ready mixed enamel paint Provision for water supply and sanitary arrangements @12.5% Provision for electrification @7.5% Provision for architectural appearance @2% Provision for unforeseen items 2% Provision for P.S.and contingencies @4% Quantity Unit 3 34.75 6.62 12.036 56.34 m 3.303 m 6.26 4.2 Rate Per Amount 3 465 1545 195.20 2291 10m 1615.90 3 1m 10228.00 3 10m 235.00 3 m 129075.00 6030 m m 3 m 603 1452 m 3 m 37748.00 6098.40 6.3 m3 1650 m2 10395.00 5.4 m 2300 m 582 10m 2 116 10m 2 4230 10m 2 17766.00 335 10m 2 8477.17 128090.00 m3 m33 m 3 3 2 2 222.72 m 2 264.72 m 42 2 m 25.305 m2 3 19918.00 3 2 12420.00 12962.30 3070.75 16011.25 9606.75 2561.80 2 SURVEYING 163955.23 VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS LECTURE NOTES VI SEM/II YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS LECTURE NOTES VI SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF 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& TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY 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VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY CE2402 / ESTIMATION AND QUANTITY SURVEYING LECTURE NOTES VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES EXAMPLE ØCalculate the total rough cost estimate and cost per Flat for a multi-storey (4-storeyed) block consisting of 40 residential flats. Other details are given in the table: Sr. No PORTION AREA (sq. ft.) Building Works Sanitory Works Electric Services 1 Main Flat Area (i) Ground Floor (ii) 3rd Floor (iv) 3rd Floor 2003 (st.) Services 1 Main Flat Area (st.) Services and Walkways = 15,00,000/2- Land Scapping = 12,00,000/3- External Sewerage = 7,00,000/4- External Water Supply, Overhead and Underground Water Tanks with pumping machinery for each set of Flats = 19,00,000/5- External Electricity = 3,00,000/6- Boundary Wall = 6,00,000/7- Miscellaneous unforeseen items = 8,00,000/8- Add 6 % development charges. 9- Add 3 % consultancy charges EXAMPLE 2 • Prepare a Rough-cost Estimate of a residential building project with a total plinth area of all building of 1500 sq.m. given that: • linth Area Rate = Rs: 950.00 / sq. ft. • Extra for special architectural treatment = 1.5 % of the building cost. • Extra for water supply and sanitary installations = 5 % of the building cost. •Extra for internal installations = 14 % of the building cost •Extra for Electric & Sui gas services = 16 % of building cost •Contigencies 3 % overall •Design charges = 2 % overall EXAMPLE 3 •Prepare a Rough-cost Estimate based on unit costs of per unit plinth area basis of four storeyed office building having a carpet area of 2000 sq.m. for obtaining the administrative approval of the CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Government. It may be assumed that 30 % of the built up area will be taken by the corridors, verandas, lavatories, staircase, etc. and 10 % of built up area will be occupied by walls. The following data is given: •Plinth Area Rate = Rs: 1100.00 / sq. ft. •Extra for special architectural treatment = 0.5 % of the building cost. installations = 14 % of the building cost •Extra for electric services = 2.5 % overall •Design charges = 2.5 % overall •Contigencies = 2.5 % overall •Contigencies = 2.5 % overall •Design charges = 2.5 % overall •Design charges = 8 % overall •Design charges = 2.5 % overall •Design charg obtaining the administrative approval of the Government for a hospital project to serve both indoor and outdoor patiesnts in an important rural area. The hospital will consist of the following: •Main administrative office with dispensing operations, etc. •Two general wards, each of 20 general beds. •Superintendent Doctor's Residence. •Two Assistant Doctor's Residences. • Eight single Nurses Quarters. • Four Compounder's Quarters. • Twelve lower staff's Quarters. • Twelve lower s been finalized. •The mistakes, if any, in the rough cost estimate are eliminated in the detailed estimate are submitted to the competent authorities. The whole project is sub-divided into different items of work or activities. The quantity for each item is then calculated separately from the drawings as accurately as possible. The procedure is known as "taking out of quantities". CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES •The quantities for each item may be estimated and shown in the pattern which is called "Bill of quantities." •The unit, in which each item of the wok is to be calculated, should be according to the prevailing practice as followed in various departments of the country. Sr. No Description of Item PRICED BILL OF QUANTITIES Quantity Remarks Unit Rate Cost DETAILED ESTIMATE • Each item of the work is then multiplied by its estimated current rate calculated by a fixed procedure to find out cost of the item. • At the end, a total of all items of the work is then multiplied by its estimated cost. • The rates are usually as per Schedule of Rates for the locality plus a premium to allow for rise in labor and material rates over and above the schedule of rates. •A percentage, usually 5% is also provided on the total estimated cost for the work to allow for the possible contingencies due to unforeseen items or expenditure or other causes, besides 2% establishment charges. DETAILED ESTIMATE ØBesides drawings and details of measurements and calculation of quantities), the following documents are also usually submitted with the detailed estimate for obtaining History, necessity, scope and main features of the project, its design, and estimate, etc. 2. Specifications lying down the nature and class of work and material to be used in various parts of the work. 3. The abstract of cost (priced Bill of Quantities) showing calculations for important parts of the structure. In fact, in estimating the art and skill lies only in the computation of details without any omissions, of all parts of the building or work. CLASSIFICATION DEPENDING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 1- CONTRACTOR ESTIMATE It is made by the contractor for determining the price or prices to be bid. It is usually a carefully prepared detailed estimate. 2- ENGINEER'S ESTIMATE This type of estimate is made by the Engineer (Consultant) usually for the purposes of financing the work and for checking bids and running bills submitted by contractors. 3- PROGRESS ESTIMATES •These of estimate is made by the Engineer (Consultant) usually for the purposes of financing the work and for checking bids and running bills submitted by contractors. are made by the Engineer at regular intervals for the completed parts of the project during the project during the project during the amounts of partial payments to be made to the contractor. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES CONTRACT DEFINITION • An agreement made between two or more parties which is enforceable by law to provide something in return for something else from a second party. • A construction contract is a contract specifically negotiated for the construction of an asset or a combination of assets that are closely interrelated or interdependent in terms of their design, technology and function or their ultimate purpose or use. Contract = offer + acceptance + consideration •It can be very simple or they may be very long and complicated legal documents •It can be very simple or they may be very long and complicated legal documents of their ultimate purpose or use. that are common to most design and construction Projects are : Project Planning Design Development Construction Procurement (Bidding Phase) Construction Process CE2402 / ESTIMATION AND OUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Why contract is necessary in construction? • Reduced stress for owner • Easy work and growth of the company. • Single point of contact for owner simplifies communications. • Owner protected against changing prices for materials, labor, etc. • Cost is known at the start of the project Why contract is necessary in construction? Describe scope of work Establish time frame Establish time fram construction: CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Describe scope of work Establish time frame Establish cost and payment provision Set fourth obligations and relationship Minimize disputes Improve economic return of investment act oIdentify the parties oPromises and responsibilities oScope of work oPrice and payment terms oCommercial terms and conditional) Lump Sum Contract •One price for the whole contract •Lump sum includes costs plus overheads and profits •Price quoted is a guaranteed price as per contract documents. •Payment based on a scheduled percentage scheme (monthly progress claims) •The contractor is free to use means and methods to complete the work and responsible for proper performance •Work must be well defined at bid time. Contract/ advantage • Low risk on the owner, Higher risk to the contractor • Cost known at outset • Contractor will assign best personnel • Contractor selection is easy. Lump Sum Contract/disadvantage • Changes is difficult and costly. contract the engineer and/or contractor agrees to do the a described and specified project for a fixed price. Also named "Fixed Fee Contract". Often used in engineering contracts. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES •A Fixed Fee on Lump Sum Contract is suitable if the scope and schedule of the project are sufficiently defined to allow the consulting engineer to estimate project costs • Payment may be staged at intervals on the completion • The contract has a very limited flexibility for design changes. • The tendered price may include high level of financing and high risk contingency. • Where considerable risk has been places with the contractor, this contract may lead to cost cutting, trivia claims, or bankruptcy. •Contract final price is known at tender. •An important risk t the client is that of not receiving competitive bids from desirable contractors who may avoid a high-risk lump-sum contract. •This contract may be used for a turnkey construction. •It is appropriate when work is -defined in detail, -limited variations are expected, -level of risk is low and quantifiable, and -client does not wish to be involved in the management of his project. Unit Price Quote Rates / Prices by units No total final price Re-negotiate for rates if the quantity or work considerably exceeds the initial target Payment to contractor is based on the measure. Unbalanced bids Higher risk to owner Ideal for work where quantities can not be accurately established before construction starts. Unit Price contractor is based on units of works Time & cost risk (shared) üOwner : at risk for total quantities üContractor : at risk for fixed unit price. Large quantities changes (>15-25%) can lead to increase or decrease of unit price. Unit Price / Requirement •Adequate breakdown and definition of work units •Good quantity surveying and reporting system. •Payment based on the measurement of the finished works. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES •Quantity sensitive analysis of unit prices to evaluate total bid price for potential quantity variation. Unit Price / advantages •Suitable for competitive bid •Easy for contract selection •Early start is possible •Flexibility : quantities and scope can be easily adjusted Unit Price / Disadvantages vFinal cost not known from the beginning (BOQ only is estimated) vStaff needed to measure the finished quantities and report on the units not completed. vUnit price sometime tend to draw unbalanced bid. (For Unit-Price Contractor's profit. Contractors raise prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices on certain items and make corresponding reductions of the prices of the p cost plus a negotiated reimbursement to cover overheads and profit. 2.different methods of reimbursement : -Cost + fixed fee - Cost + fixed fee type of contract the contractor can start work without a clearly defined project scope, since all costs will be reimbursed and a profit guaranteed. Advantages Disadvantages -Fee = percentage of the total project cost • (Cost = \$500.000, Fee = 2%) Advantages Fee amount is fixed regardless of price fluctuation techniques may be used to expedite construction Provides incentive to complete the project quickly Cost + Fixed Fee CE2402 / ESTIMATION AND QUANTITY SURVEYING Expensive materials and construction VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES • Fee = percentage of the original estimated total figure – Utilized on large multi-year jobs – Ex: WW treatment plant Facility (Cost = \$20 million, Fee = 1%) – \$20 million 1% fee = \$200,000 million Cost Plus Fixed Fee – Most common form of negotiated contracts -COST = expenses incurred by the contractor for the construction of the facility •Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and administrative costs - FEE = compensation for expertise • Includes: Labor, equipment, materials, and experime + Fixed Fee + Profit-Sharing Clause -Rewards contractors who minimize cost -Percentage of cost under GMP is considered profit sharing is specified in contractor must absorb any amount Cost + Fixed Fee + Profit-Sharing Clause variation of this type of contract is called a guaranteed maximum price (GMP). • In this type of contract the contractor is responsible for covering any additional costs within the original project scope • An incentive clause, which specifies that the contractor will receive additional profit for bringing the project in under the GMP. Construction Documents Bidding requirements Notice to Bidders Instruction to Bidders Instruction to Bidders Instruction Soft Forms Conditions of the Contract Forms Conditions of the Contract Specifications Drawings Addenda CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Change Orders Agreement. Construction Documents are defined as the written and graphic documents prepared or assembled by the A/E for communicating the design of the project and administering the contract for its construction. • 2 major groups 1. Bidding Requirements Used to attract bidders & explains bidding process 2. Contract Documents Legally enforceable requirements that become part of the contract Include all construction documents except bidding forms CONSTRUCTION DOCUMENTS BIDDING REQUIREMENTS BIDDIN are used to attract bidders and explain the procedures to be followed in preparing and submitting bids. Bidding documents All of the construction documents All of the construction documents All of the construction documents and submit bids. issued to bidders before the signing of an owner-contractor agreement. Bid Package Documents available to the contractor and on which he must make a decision to bid or not A set of plans and technical specifications, Proposal form, general conditions, Special conditions, Description of the project to be constructed DEFINITION ¢An offer in writing to execute some specified work or to supply some specified articles at certain rates, within a fixed time under certain conditions of contract and agreement, between the contractor and the department or owner or party WHY TENDERING ???? (A)Procurement of goods in Public Interest – i.Efficiency, ii.Economy, iii.Transparency (B) Fair & Equitable treatment of suppliers (C)Promotion of Competition CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES CONTRACTUAL RELATIONSHIPS COMPETITIVE TENDERING & TECHNOLOGY LECT a project lRelies on the information contained in drawings, specifications and bills of quantities prepared on behalf of the construction client. ITypes —Open —Selective ¢One or two stages —Single Tender OPEN TENDERING lAllows any contractor to submit a tender to an advertised project lProcess —Client advertises openly in the press or the trade publications inviting contractors to apply for the project —Contractor that is able to under take the project would request a tender document —After receiving the tender. This is done to filter out the contractors who are not interested in submitting and to ensure a bona fide tender. tender. OPEN TENDERING ¢Advantages lMaximum competition lLowest price obtained ¢Disadvantages lLarge waste of effort because too many contractors are tendering lContractor submitting lowest tender irrespective of reputation of contractor lPoor quality building or bankruptcy may occur SELECTIVE TENDERING lWhere contractors of known reputation are selected to deliver the project lCommonest method of awarding a tender —The cheapest among them is selected to deliver the project lCommonest method of awarding a tender lProcess —A design team selected to deliver the project lCommonest method of awarding a tender with the project lCommonest method of awarding a tender with the project lCommonest method of awarding a tender lProcess —A design team selected to deliver the project lCommonest method of awarding a tender with the project lCommonest method of awarding a tender with the project lCommonest method of awarding a tender lProcess with the project lCommonest method of awarding a tender with the project lCommonest method of awardi known to them and invite them to tender for the project CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES — Contractors' tenders are usually based on a completed design — Project is awarded to the contractor with the lowest tender. TENDERING ¢Advantages lAs tenderers are known, selection of cheapest bid is not as high a risk as in an open tender ¢Disadvantages lLimiting the number of tenderers may exclude new bidders who may offer more innovative ideas or slutions TWO-STAGE TENDERING lAim - to speed up the procurement process by getting the architect and the contractor to start the project as soon as possible. —With this approach the contractor will be able to start work (e.g. excavation, foundations) on site as soon as possible. IImprove build ability - utilising skills of architect and contractor lProcess —Usually a contractor will be chosen through a form of selective competition with a simple bill of approximate quantities, these will be: \$The preliminary items of measured work TWO-STAGE TENDERING —Where contractors' tenders are based on a partially developed consultants design (Stage 1 tender). The contractor then assists with the final development of the design and tender documents, against which tenders for the construction works are prepared (Stage 2 tender). The first stage tenderer has the opportunity to include as Prime Cost Sum, upon which contractors are given the opportunity to include sums for profit and attendance. —The client will also ask the contractor to state their overheads and profits. These prices will determine the price agreement that will be negotiated with the successful contractor. TWO-STAGE TENDERING ¢Advantages lAllows contractor to have input into design and build ability and helps team-building, thereby helping avoid future adversarial attitudes lFast tendering lSpeed of construction (build-ability) lCosts are known for quick negotiation ¢Disadvantages lThe architect and contractor might not agree on designs lDue to problems with architect and contractor the project completing time could suffer CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES SINGLE TENDER q If only a particular firm is the manufacturer qEmergent need to procure from a particular source qTechnical reason to be recorded (standardization of machinery – HP, SONY etc.) N.B. - Single response to an open bid can't be termed as Single Tender NEGOTIATION TENDER ¢The process of negotiation tendering involves the client consulting chosen contractors to negotiate the contract and its terms. ¢ This process is adopted for special circumstances. For example, it is often used in emergency situations that require the completion of a project within a short span of time or with complex contracts in which financial and technical properties are difficult to identify. ¢This negotiation tendering process is also used in situations involving security projects of national importance. WEB-BASED TENDERING ¢Web-based technology is used for the tendering processes. ¢Under this system, tenders are advertised online and tender documents uploaded. Any interested person can fill out the tender documents and bid for a project online. Various electronic tendering applications are used in countries like America, Australia, Europe and Japan. TENDER EVALAUTION ¢Evaluation may be 2 stages lPre-tender or Pre-Qualification (Pre-Qualification (Pre-Qualification)) — Ensure that contractors are ¢Reputable ¢Experienced lPre-Contract – Ensure that contractors ¢Fully understand the contract ¢Bid is realistic ¢Proposed resources are adequate TENDERING lInvitation to Tender must be received —that the tender must be enclosed in a sealed envelope or package marked with the word 'Tender' followed by the subject to which it relates and the deadline for tender receipt. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES —Adequate time must be allowed for the preparation and return of tenders depending on size of project. IReceipt, Custody and Opening of Tenders —All tender envelopes or packages received must be marked with the date and time of receiving officer, and recorded as such but must not be considered. —Tenders shall be opened at one time and in the presence of at least two officers who shall be independent of each tender. lAcceptance of Single Quotation or Tender Received —Where only one tender or quotation is a complete record of all tenders opened, showing the date and time of opening and the value of each tender. received, the Project Director could determine for contracts up to a certain price whether or not to accept the quotation or tenders. —In the event of the lowest tenderer withdrawing his offer, the second and third lowest tenderers should be informed that their tenders were not the most favourable received but their offers are being actively considered. Nominated Sub-Contractors and Suppliers —Where nominated sub-contractors are to be used, they must go through a similar process to the main contractor TENDERING ¢Tenderers shall certify and give undertakings that: Ithe tender is genuine and intended to be competitive; Ithey have not fixed or adjusted the amount of the tender by or under or in accordance with any agreement or arrangement with a second with a se time and date specified for the return of the tender, any of the following: linform any person the amount of the proposed tender, except where the confidential disclosure of the approximate amount of the tender was necessary to obtain insurance premium or other quotations necessary for tender preparation; lenter into any agreement or arrangement with any other person with the aim of preventing tenders being made or as to the amount of another tender or the conditions on which the tender is made; loffer to pay or give any sum of money or valuable consideration directly to any person for doing or having done or causing or having caused to be done in relation to any other tender or proposed tender for the Council any of the actions specified and described in this section; lcause or induce any person to do any of these things TENDER DOCUMENTS CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES lCovering letter lAn invitation to tender lInstructions of other professionals and parties involved lDraft of basic terms and conditions of contracts lStandard forms for tenders including the quality and price schedules, health & safety questionnaires IDetails of information required from the tenderer as part of the submission EARNEST MONEY DEPOSIT ¢To safeguard the interest of Deptt (withdrawal / alter the bid by bidder) ¢Exemption – Regd. With Central Purchase Organisation / National Small Industries Corporation ¢EMD - 2 % to 5% of estimated value ¢Can be DD/ FDR/Banker Cheque /BG ¢Unsuccessful bidders EMD should be returned /refunded at the earliest. PERFORMANCE SECURITY ¢From the successful bidders of completion of all the contractual obligations of the supplier including warranty ¢Bid Security should be refunded on receipt of Performance Security ARBITRATION •The process by which the parties under a committee of experts in a judicial manner. •The impartial persons are known as the Arbitrators by which the parties under a committee of experts in a judicial manner. Advantages •When the subject matter of the dispute is highly technical, arbitration is often faster than litigation in court *5+ •Arbitration can be cheaper and more flexible for businesses •Arbitral proceedings and an arbitral award are generally non-public, and can be made confidential [6] • In arbitral proceedings the language of arbitration may be chosen, whereas in judicial proceedings the official language of the country of the competent court will be automatically applied • Because of the provisions of the New York Convention 1958, arbitration awards are generally easier to enforce in other nations than court judgments CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES • In most legal systems there are very limited avenues for appeal of an arbitral award, which is sometimes an advantage because it limits the duration of the dispute and any associated liability Disadavantages • Arbitration may be subject to pressures from powerful law firms representing the stronger and wealthier party [citation needed] • Arbitration agreements, or in small print in other agreements, and consumers and employees often do not know in advance that they have agreed to mandatory binding pre-dispute arbitration by purchasing a product or taking a job • If the arbitrators, the parties are required to pay for the arbitrators, which adds an additional layer of legal cost that can be prohibitive, especially in small consumer disputes [citation needed] • In some arbitration agreements and systems, the recovery of attorneys' fees is unavailable, making it difficult or impossible for consumers or employees to get legal representation [citation needed] • In some arbitration codes and agreements provide for the same relief that could be granted in court • If the arbitration for means that an erroneous decision cannot be easily overturned •Although usually thought to be speedier, when there are multiple arbitrators on the panel, juggling their schedules for hearing dates in long cases can lead to delays •In some legal systems, arbitration awards have fewer enforced in the same manner as court judgments and have the same effect • Arbitrators are generally unable to enforce interlocutory measures against a party, making it easier for a small group of members in arbitration due to increasing legal fees, without explaining to the members the adverse consequences of an unfavorable ruling •Rule of applicable law is not necessarily binding on the arbitrators, although they cannot disregard the law [citation needed] •Discovery may be more limited in arbitration or entirely nonexistent •The potential to generate billings by attorneys may be less than pursuing the dispute through trial •Unlike court judgments, arbitration awards themselves are not directly enforceable. A party seeking to enforce an arbitration award must resort to judicial remedies, called an action to "confirm" an award CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES •Although grounds for attacking an arbitration award in court are limited, efforts to confirm the award can be fiercely fought [citation needed], thus necessitating huge legal expenses that negate the perceived economic incentive to arbitration. In general, two groups of legal procedures cannot be subjected to arbitration: •Procedures which hecessarily lead to a determination which the parties to the dispute may not enter into an agreement upon: [7] Some court procedures lead to judgments which bind all members of the general public, or public authorities in their capacity as such, or third parties, or which are being conducted in the public interest. For example, until the 1980s, antitrust matters were not arbitrable in the United States. [8] • Matters relating to crimes, status and family law are generally not considered to be arbitrable, as the power of the parties to enter into an agreement upon these matters is at least restricted. However, most other disputes that involve private rights between two parties can be resolved using arbitration. In some disputes, parts of claims may be arbitration tribunal, but the validity of a patent could not: As patents are subject to a system of public registration, an arbitral panel would have no power to order the relevant body to rectify any patent registration. e.g. consumers. Examples: German law excludes disputes over the rental of living space from any form of arbitration, [9] while arbitration agreements with consumers are only considered valid if they are signed by either party, [10] and if the signed document does not bear any other content than the arbitration agreements with consumers are only considered valid if they are signed by either party, [10] and if the signed document does not bear any other content than the arbitration agreement Sum in Dispute (Claim + 1,42,000 + 0.9% excess over 20,00,000 50,00,001 to 1,00,00,000 1,96,000 + 0.5\% excess over 50,00,000 1,00,000 0,000 5,00,000 1,00,000 0.06% excess over 10,00,000 Kinds of Arbitration CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 1. Arbitration with intervention of a court, where there is no suit pending 3. Arbitration in suits Arbitration without intervention of a court •It arises from the execution of an arbitration agreement •The court may set aside the award of the arbitrator is declared , the parties concerned can apply for a decree on the award, same as any other decree of a court of law Arbitration with intervention of a court • The section of the act gives an alternative right to the parties to an arbitrator in Suits (Cases) • When a suit is pending before a court and when the parties desire to settle the same through arbitration before the judgement is pronounced, they can apply for the same and in such cases, the court may refer the matter to the arbitrator, apppointed in such a manner as may be agreed upon between the parties. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES UNIT- IV VALUATION Introduction The following the methods of valuation being adopted in General practice by a practicing valuer are: Land and Building Method Rent Capitalization Method Development Method Direct Comparison Method Land Building Method: By this method, the value of the land and the value of Building are assessed separately and added to get the present value of the property. Depreciation is calculated either by straight line method of valuation consists in capitilisation Method: Rental Income (NARI) at an appropriate rate of interest or rate of capitilisation. Net annual rent income equals to Gross Annual Rental Income (GARI) minus outgoings like Property Tax, repairs, maintenance, Service Charges etc. Development Method): This method is used to evaluate such property where there is a development potential, so that the value of the property after development will be increased more than the expenditure incurred. For example, a large portion of land for a residential Colony or a large complex of multi-storied buildings, housing ownership flats in a Co-operative Housing Society. Profit Method: This method is applicable to Hotels. Cinema Theatres, Marriage Halls and Public Places. This method as the name suggests deals in working the profit from a property and subsequently capitalizing the same at appropriate rate of return depending upon a number of factors. The net profit to be adopted should be ar average of last three years of profit. Part of the profits is due to goodwill which should be properly reflected in the rate of return. GENERAL Procedure to do the Valuation of Building o o o o Measure the Plinth Area. Observe the specification and other factors which affect the value. Adopt suitable Replacement Rate of construction (for the Building portion alone) depending upon the existing conditions and specifications. Multiply the plinth area by the unit rate to get the replacement value of the Building. CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS V SEM/III YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY o O LECTURE NOTES Estimate suitable total life of the Building. Assume suitable % age for salvage value). If the age is not known or if the building has crossed its service life, estimate future life and calculate the depreciation by using the formula. D = x (100 - % age salvage value) o Depreciation % age multiplied by the Replacement value will be the Depreciation Value. Present Value – Depr. Value This is the value of Building. o Add suitable depreciated value for other works like Amenities, extra works, miscellaneous works etc. o Add suitable value separately for services depending upon the actual's specifications. Different Methods of Valuation 1) Land and Building are assessed separately and added to get the present value of the property Valuation of Land to be considered i) Guide lines from Registrar's Department (Circle rates) ii) Price paid within a reasonable time, in bonafied transactions of purchase of lands acquired. iii) Demand, locality, characteristics like shape, size and location of Roads and Parks. iv) Opinions of relevant person such as Neighbors, Brokers and recent sales and prevailing trend. Valuation of Building to be considered Plinth area rates bases on CPWD or State PWD and adjusted by Index cost, Present Value of Building Flats: The above method of Land and building method can not be applied on flats since G. House societies and DDA/ MCD Flats are effected by various factors like common passages, lifts, common places of assembly, parking. Mostly it depends on Social built up of the housing complex also. The rates are assessed from Per Square feet rate of the super area which includes Plinth area + common areas such as 15-20% higher than the plinth area. The valuation is done, thus on Prevailing rates of the super area in the locality. Area are Defined as 1) Floor Area 2) Plinth Area 3) Super Area We will discuss on this when we take up the Land/ Building/ Flat valuation in details. CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS V SEM/III YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 2) Rental Capitalization Method: It consists of capitalizing the net annual Rental Income (NAR) at an appropriate rate of Interest and rate of Capitalization (80% as per Wealth Tax rules for Delhi / NCR) Net annual Rental Income – outgoings like Property tax, repairs, maintenance service charges, Insurance premiums, rent collection and management charges etc. app. 40% 3) Development Method: This method is used to evaluate such property where there is a development after development will be increased more than the expenditure incurred, for example large portion of land can be divided in small plots and development will be increased more than the expenditure incurred, for example large portion of land can be divided in small plots and development will be increased more than the expenditure incurred, for example large portion of land can be divided in small plots and development will be increased more than the expenditure incurred, for example large portion of land can be divided in small plots and development will be increased more than the expenditure incurred. residential societies, or a large complex of multistoried buildings, shopping / commercial complex etc. In such case the cost is decided per acre (4840 Sqyd). The cost of Development which is 20% : It includes i) Roads ii) Gardens / Parks iii) Underground drains iv) Electric mains and sub station v) Earth filling / cutting vi) M.C taxes vii) Sewage B) Professional Charges to Architect Engineer C) Cost of obtaining Vacant Possession from the existing occupant is required. D) Developers Profit: 15-25% This is a vast subject and shall be taken up separately. 4) Profit Method: This method is applicable to Hotels, Cinemas, PVRS, and Marriage Halls. This method as the name suggests deals in working the profit from the property subsequently capitalizing, the same at appropriate rate based on factors. i) AV of Net Profit for last three years ii) Good will of the Property This is in general as to what the Profession of Valuation is and is required to be done dedicatedly and with honesty. MORTGAGE: An owner can borrow money against the security of his property, and for that purpose he is required to be returned in specific time. The person who takes the loans is known as Motgagor. advances the loan is known as Motgagee LEASE: BUILDING LEASE : The owner of a freehold land out his plot of land to somebody to construct a building on payment of a yearly ground rent by the leaseholder CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS V SEM/III YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES At the end of the lease period, the lease period on payment of certain amount of annual rent. The lease period should be 10 to 30 years Tha maintenance of the structure is usually done by the leaseholder which may be provided in the lease deed(document) CE6505 / DESIGN OF REINFORCED CONCRETE ELEMENTS V SEM/III YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES UNIT V REPORT PREPARATION Principles for report preparation - report on estimate of residential building - Culvert - Roads - Water supply and sanitary installations - Tube wells. PRINCIPLES FOR REPORT PREPARATION: Minute writing As minutes are the documents administrators are most often called upon to produce following a meeting, we begin by distinguishing reports from minutes. The purpose of minutes is to provide a permanent, and publicly-accessible, record of what passed at a particular meeting. For those unable to attend a meeting, minutes provide a summary of the discussions which took place, the decisions which were reached, and the actions which are to be taken as a consequence of decisions reached at the meeting. Minute-writing thus involves summarising the key points of the meeting, and ensuring accurate representation of all that took place. The key feature of minutes is their objective and neutral tone, and the breadth of the information they provide: they record all discussions that took place, placing no emphasis on particular discussions or points. The structure of minutes is generally dictated by the agenda that was circulated prior to the meeting, which provides details of what is to be discussed. Although reports are taken to provide a verbatim account of what passed at a meeting, reports provide an accurate and concise summary of the discussions and events leading to a particular outcome. They involve an investigation - often by a forum, workshop or panel - followed by conclusions and recommendations. In this sense, they place emphasis where minutes don't. They are concerned less with capturing what was discussed and more with exploring how a particular outcome was reached. A report is therefore written to the final decisions and outcomes, and will reflect a logical argument culminating in a recommendation for a particular action. To highlight the difference between reports and minutes, let's consider reports produced in a slightly different context. If we think of a news report, we find an editor commissioning a journalist to investigate an issue of concern to the public, often by going along to an event and observing what happens. The journalist will film the event, making notes and finding out what CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES s/he can about the background to the event. S/he then chooses an angle which makes the story interesting and relevant to viewers while still accurately and objectively reflecting what passed. The filmed material is edited so that it forms a logical narrative, with the reporter introducing the events with some background and contextual information. The news report is concluded with some reflections on what was found, and what might be done to change/ fix the situation. Reporters take a mass of information and condense it into something easy to grasp. By super-imposing this onto writing a report in the HE environment, we find a Chair commissioning an officer/ secretary to produce a report of an event (usually a workshop or panel discussion) that describes and summarises the results of an investigation and subsequent discussion) that describes and summarises the results of an investigation and subsequent discussion. information clearly, concisely, accurately and objectively. The aim is to clarify. To get their story across, they also need to make it punchy and easy to understand. And so it should be with your report. Planning a report Dictionary definitions of reports include: A statement of the results of an investigation or of any matter on which definite information is required. Oxford English Dictionary An account prepared for the benefit of others, especially one that provides information obtained through investigation and published ... or broadcast. Collins English Dictionary These definitions capture many of the salient features of reports and are captured by the three foundations of report writing: defining the purpose of the report; investigating the topic thoroughly; organising the information into sections. A useful report rests on these in turn. Defining the purpose of a report Before you can begin communicating, you need to clarify: why you are writing; what to include; what to leave out; who your readers are. The purpose of a report is to present facts, findings and conclusions in such a way that the recommendations are accepted and acted upon. By expressing the purpose in a single sentence, CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES your attention is focussed, making it much easier to take notes of the event and structure the information should be clear and useful. If you are unsure whether to include something, ask yourself, "So what?". What is the purpose of the point you are making? Does it support the conclusions and recommendations? Will it assist the participants in making amendments or changes? All reports set out a series of facts based on evidence. The information must be verifiable and presented in a way that is useful to the reader. area the report is investigating however as reports are used both to communicate and to inform, it should be possible for a reader to understand what is written without any previous knowledge. When considering what to include, think about what your readers already know, what you need to tell them, and what use they can make of the information in the report. If you have a clear idea of the purpose of the report, knowing what to include and how to structure the information will rest on the content. Most reports in HE are concerned with investigations by panels or workshop participants. The information is likely to come from supporting documents that were held around the information, the observations that were made, and conclusions reached. Prepare yourself for report-writing by reading all the supporting documents. The more familiar you are with the information that is being discussed, the easier it will be to follow the discussions, and identify important points that should be noted. should prepare you for the actual investigation (panel or workshop), ensuring that you are able to listen actively to what is said. This supports your ability to note important points and organise the information in a meaningful way. Organising the information in a meaningful way. the investigation and discussion. Reports should have a logical structure presenting a coherent argument, with the format providing clear sign-posts to indicate what conclusions will be reached. It should be easy for readers to find the information they want. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Remember, the key is to be clear, concise and persuasive. The way you organise the information you have gathered affects both the structure and sense of the report. It is the first step to writing as it involves planning the structure and layout, and deciding what you want to say, in what order. You will usually have a mass of information including written notes, observations, participation in discussions, supporting documents and appendices. By planning how to arrange and present this, you save yourself time and are likely to produce a better-organised, clearer report. The structure of a report tends to mirror the recommendations and conclusions reached, as opposed to an agenda. When writing up minutes, the structure is determined by what follows from the meeting; it is based on the agenda. When writing a report, the structure is determined by what follows from the meeting; it is based on the agenda. conclusions, and then structuring the rest of the information around these outcomes/ findings. The chair of most panels or workshops will summarise the conclusions and recommendations at the end of the event, which provides a useful initial template for the body of your report. Two useful ways of planning are: Creating an outline by noting down all facts, observations and ideas as you remember them. Once you have all your points on paper, organise and group them into sections, assessing whether they are relevant to the conclusions and recommendations. You can then number the points in order and begin organising them under headings using arrows and lines to link up related points. With this method, you will gradually get a network of ideas grouped under headings which provides you with the structure of your report. Mind-mapping. Write your topic in the middle of the page and draw lines to branch out from it with your main ideas. By pouring your ideas out at random, and linking main ideas to each other, you can concentrate on the content, and the order and organisation will emerge from allowing your ideas to flow into themes. Structuring a report The accepted structure for a report includes 5 sections at least, although you may wish to include additional sections such as an abstract, title page and appendices of supporting documents. There is no need to write your report chronologically. In many instances, it is easier to begin writing the final section (recommendations), and finish with the summary or introduction. Complete the various sections in whatever order makes most sense to you, slotting them into the structure once you have a first draft, it should be easier to see whether the report rests on the key foundations of defined purpose, thorough investigation and logical argument (organised information). CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES The formal structure of a report is generally as follows: 1. Summary There are two schools of thought on summaries and what you choose will probably be informed by the type of report as an executive summary providing readers with an overview. Here, it should provide enough detail to give a good idea of what passed, and what the key conclusions were, without having to read the entire report. Or it can be placed with the conclusions where it provides a round-up of the key points supporting the conclusions where it provides a round-up of the key points supporting the conclusions where it provides a round-up of the key points supporting the conclusions where it provides a round-up of the key points supporting the conclusions where it provides a round-up of the key points support of the key poin

an overview of the purpose and conclusions of the report. The summary should be concise, informative, and able to stand alone from the report. This section condenses and focuses information, drawing objective findings from detailed data and discussions. It is probably best written after you have drafted the entire report. The summary should be concise, informative, and able to stand alone from the report. is a good yardstick for the overall clarity of the report; if you can't sum up the findings in a paragraph, the report may be lacking a coherent narrative or structure. 2. Introduction and background The introduction provides contextual information for the entire report. It should cover: the topic under investigation, the purpose of the report, the method (how the information was gathered and conclusions reached), the source of information. Include details on the scope of the report, and a brief background to the subject under investigation. Returning to our news report analogy, the introduction provides brief answers to the 5 W's and H: who, what, when, where, why, and how? 3. Discussion The discussion forms the main body of your report. It contains all the facts and details, and provides an account of the discussions which lead to the final outcomes. The discussion is presented as a logical argument culminating in the conclusions and recommendations. always have a message and this should emerge clearly from this section. As you are likely to have quite a lot of information to present, this section should be divided into sub-sections under descriptive headings which reflect the discussion which OF ENGINEERING & TECHNOLOGY LECTURE NOTES To make it easier for readers to find information, use a progressive numbering system where each section sof the section title and should express stand-alone, discrete points. Where a point is complicated, or there are linked issues to note, list these as sub-sections of the paragraph using decimal points. For instance: 1. Section title 1.1 1.1.11.1.2This provides your report with a coherent structure, and makes it easier to read and use in an active sense. It also helps the reader focus on, and respond to, particular issues raised in the recommendations by allowing him/ her to refer to a numbered paragraph. Finally, it is useful should you decide to include a table of contents. 4. Conclusion The conclusion outlines the main findings of the investigation. It is the logical progression from the main discussion where all the information was analysed. In the conclusion, the results are interpreted, and attention is drawn to the significance of key points and information. In many instances, the conclusion can be based on the summing up by the chair at the end of the discussion/ event, and may include thanks extended to participants and other contributors. This section should be brief. 5. Recommendations Reports provide an account of discussions leading to an outcome. Their purpose is to persuade, and the recommendations should flow naturally from the conclusions as suggestions for addressing problems identified in the conclusion. Recommendations should be noted in full detail as they form the basis for amendments in information and policy. Where relevant, include details of deadlines and timeframes. Publishing a report CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES As with all pieces of writing, it often helps to leave some time between writing the first draft of a report and producing the final version. Returning to the draft after a break can give you fresh eyes, allowing you to assess whether the report rests on firm foundations, is well-structured and communicates its findings and recommendations in a clear and informative way. If you are satisfied with your final draft, the report can be submitted. As a report is a commissioned piece of writing, it must be approved before it is released. Generally, it is the chair of the event (usually a panel, or workshop) that is responsible for checking the report and giving approval for its publication. Once the final draft has been approved, send a copy to all participants of the event, drawing attention to any deadlines attached to the recommendations. A copy of the approved report is retained by the faculty/ department and, where appropriate, is published for general access. ACCURACY: Report factual information – e.g., "I saw. Report information gained from the physical senses – e.g., sight, smell, taste, auditory, and touch. Be aware of feelings that may destroy objective descriptions. Strong feelings can cause the writer to seek evidence to support her feelings and reject evidence that does not support them. Make distinctions between fact and hearsay, fact and opinion, and fact and conclusions. Be clear about the meaning of words; avoid jargon. Clarify all abbreviations, such as SOB for shortness of breath. Proofread the report and rewrite as needed. CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES Completeness is achieved by reporting all the facts discovered during the course of an investigation. When in doubt, include the information. Information that appears irrelevant to the reviewer. In most cases, the only information the reader will have will be the information in the report. Partially stated facts can be misleading and misinterpreted. Explain why certain information is lacking or incomplete. Provide a detailed explanation of the possible source of additional information and undeveloped leads. Conciseness Avoid unrelated, extraneous, incidental, and nonessential information and detail. Pay attention to grammar. Avoid adjectives, wit, sarcasm, flowery expressions, and repetition. A report is not a literary or creative writing exercise. Use singleness of thought and purpose. A good report will give the reader a clear idea or picture of the investigation. Use headings, paragraphing, sentence structure, indentations, underlining, and capitalization to emphasize and give weight and/or visibility to information. Do not conceal or withhold information. Do not assume. Do not conclude. Maintain an unbiased and open mind about the case. Basic Principles of Good Report Writing Avoid formulating preconceived ideas about the guilt of the report in discrete sections to facilitate the reader's review and understanding of the report. Write in chronological order. Avoid ambiguous sentences and vague statements. Additional parts of the complete report may include the title page, information on undeveloped leads, investigator's conclusions, witness list, and exhibit/evidence list The Estimate Report Regardless of how an estimate is prepared, it should be presented in a clear, concise manner. The following elements are typically included in an estimate report: CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY LECTURE NOTES 1. Project title, location, list of individuals who worked on the estimate, and the date 2. Written overview of findings 3. Summary chart of estimate to budget and/or previous estimates, with identification of variances and explanations for same 6. Recommendations for corrective actions if costs vary from budget 7. Method used to prepare the estimate 8. Documents on which the estimate is based 9. Assumed schedule (bid date, construction start, completion) 10. Type of contract and procurement method assumed 11. Outline of items included and specific lists of items excluded from estimate 12. Time basis of currency included in estimate and basis of escalation included 14. Market conditions at the time of the estimate and projected to the bid date 15. Outline specifications, performance, and guality levels assumed in estimate 16. A list of alternatives examined 17. General comments on any special conditions that might affect future prices CE2402 / ESTIMATION AND QUANTITY SURVEYING VII SEM/IV YEAR

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