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The approximate estimate is done in order to find out an approximate cost in a very short time before starting the project. The estimation is made before selecting the final specification and design of the project. This method is also known as a preliminary or rough estimation. Purpose Of Approximate Estimate: 1. To evaluate the cost of a project in short time. 2. To evaluate the difference between several options. 3. To check the final cost of the project that is calculated by detailed estimation. Methods Of Approximate Estimate: A. Square Metre Or plinth Area Method: This rough estimation is done by selecting the price of 1 square meter area of a building. It is mainly adopted for calculating the cost of the following buildings: Office Buildings. Residential Buildings. School Buildings. Apartment/Flat Buildings. Hospitals. This method is considered as the best method for calculating the cost of new buildings. In case of multi-storeyed buildings, the following assumptions are to be considered for the estimation. 1. For 1 square meter area, the cost of all the floors with basement and roof are in equal costs. 2. The cost of the basement is 60% of the floor. 3. The cost of the roof is 40% of the floors. B. Cubic Rate Or Cubic Meter Method: This rough estimation method gives more exact results comparatively than the square meter method. For multi-storeyed buildings, the following assumptions are considered. 1. For 1 meter cube area the costs of all floors are equal in costs. 2. The cost of the basement is 60% of the cost of different floors. The volume of the floor is determined as Volume = Area × Height of one floor The height of one floor is found out by the following guidelines: 1. Ground Floor: The height of the ground floor is calculated from the top of the footing to the middle of the parapet. 2. First Floor: The height of the first floor is calculated from the ground rooftop to the middle of the parapet. 3. Other Floors: The height of other floors are calculated from floor to floor. Besides these methods, there are some other rough estimation methods such as 1. Cost comparison method. 2. Unit rate method. 3. Approximate quantities with the bill method. 4. Bay method. 5. The cost of materials and labor method. Also Read- Estimation Of Bricks In A Wall Center Line Method Of Estimation How To Calculate Cement Bags In 1 M3 Types Of Estimation In Civil Engineering How To Be a Successful Civil Engineer Join Telegram Channel – Civil Engineering Daily If You Liked This Article Then Please Share It With Your Friends. Here we will learn about estimation in maths including its definition and how to estimate a calculation. You'll also learn about the differences between decimals and significant figures and how to round numbers to one significant figure. There are estimation worksheets based on Edexcel, AQA and OCR exam questions, along with further guidance on where to go next if you're still stuck. Estimation is when we use approximate values in a calculation to give an approximate, predicted answer rather than an exact answer. Estimating calculations makes them more manageable by using round numbers. E.g.If we wanted to estimate the answer to 46.75 x 3.218 we could round both these numbers and use an estimated calculation of 50 x 3 = 150 A population includes everyone within a large group, for example, the population of a country includes everyone that lives within that country. A sample is a smaller group, taken from the population, for example a sample of 100 people could be taken from the total population. Samples are used when researching populations because it is usually too costly or too time consuming to carry out research on the entire population. This means that the sample must be selected carefully so that it represents the population as closely as possible. One of the best methods of selecting a sample is using a stratified sampling technique. This allows the researcher to determine the sample based on the proportional size of different subcategories within the population and then randomly select individuals for participation in the research. Step-by-step guide: Stratified sampling Once the individuals within the sample have been selected, we can carry out statistical analysis on the sample such as the mean. The sample mean is the average of the sample, whilst the population mean is the average of the population. If the sample is selected carefully, we can estimate the population mean by calculating the sample mean. Including more individuals within the sample will provide a more accurate value for an estimate of the population mean. This is because the value of the sample mean value tends towards the population mean as the sample size increases. When we estimate the numbers in a calculation, we usually round the numbers to 1 significant figure. E.g.Let's estimate 5.7 ÷ 1.8 First we estimate the value of 5.7 by rounding it to 1 significant figure (1.s.f).We can see that the first significant figure is 5.This means we need to use the digit to the right of the 5 which is 7, so we need to round 5.7 up to 6 which is the nearest whole number. So 5.7 estimated is 6 as shown on the number line. Then we follow the same process to estimate the value of 1.8 which rounded to 1 significant figure is 2. Once we have estimated all the values in a calculation we can work out the estimated answer so 5.7 ÷ 1.8 ≈ 6 ÷ 2 = 3 Estimation is used in lots of different areas of maths in order to give an approximate answer to a question, such as estimating the perimeter of a shape or estimating the size of a number written in standard form. We also see examples of estimation all around us, such as estimating the number of bricks will be needed to build a garden wall, or working out if you have enough leftover from £5 in a supermarket to buy a bar of chocolate at the till. An estimate is an approximate answer; not the exact answer Estimation relies on using easier numbers that are near to the actual numbers involved To estimate we usually round to 1 significant figure We use estimation in many aspects of life and work – for a building job or planning a budget When we are estimating calculations we still have to consider using the order of operations or BIDMAS principles ≈ means approximately equal to; = means exactly equal to In order to estimate a number: Round each number to 1 significant figure. Construct the new estimated calculation using the 'approximately equal to' symbol ≈. Calculate using the rounded numbers to give an approximate answer and consider units in the answer. Get your free estimation worksheet of 20+ questions and answers. Includes reasoning and applied questions. DOWNLOAD FREE x Get your free estimation worksheet of 20+ questions and answers. Includes reasoning and applied questions. DOWNLOAD FREE Estimate the value of: Round numbers to one significant figure 6.9 rounded to 1 significant figure is 7 96 rounded to 1 significant figure is 100 2 Write out the new estimated calculation \[6.9\times 96\approx 7\times 100\] 3 Complete the calculation using estimation If we compare this to the exact answer which is 662.4 we can see that the estimated answer is an overestimate. Brian buys 197 packets of crisps for a party. Each bag costs 45p. Use estimation to find the approximate cost in pounds £. Round numbers to one significant figure 197 is 200, rounded to 1 s.f. 45p is 50p, rounded to 1 s.f. Write out the new estimated calculation \[197 \times 45\approx 200 \times 50\] Complete the calculation using estimation \[200 \times 50 = 10000\] In this case we have to consider the units used 10000 is pence so we convert this to pounds (£) 10000 pence is £100 If we compare this to the exact answer which is £88.65 we can see that the estimated answer is an overestimate. Round numbers to one significant figure \[\frac{42 \times 389}{81}\] 42 rounded to 1 s.f. is 40 389 rounded to 1 s.f. is 400 81 rounded to 1 s.f. is 80 Write out the new estimated calculation \[\frac{42 \times 389}{81} \approx \frac{40 \times 400}{80}\] Complete the calculation using estimation If we compare this to the exact answer which is 201.7 (1 d.p.) we can see that the estimated answer is an underestimate. Estimate the value of 9.04 + 19.85 × 2.99 − 5.03 You must show your working. Round numbers to one significant figure \[9.04 + 19.85 \times 2.99 \hspace{1mm} – 5.03 \approx 9 + 20 \times 3 \hspace{1mm} – 5\] Consider the order of operations BIDMAS Multiply 20 and 3 together first \[9 + 60 \hspace{1mm} – 5\] Then follow the calculation from left to right, as it doesn't matter which operation you do first with addition and subtraction. \[9 + 60 \hspace{1mm} – 5\] Complete the calculation using estimation \[9 + 60 \hspace{1mm} – 5 = 64\] If we compare this to the exact answer which is 63.3615 we can see that the estimated answer is an overestimate. Estimate how many toys costing £8.48 each can be bought for £425? Is this an over or under-estimate? Round numbers to one significant figure £8.48 is £8, rounded to 1 s.f. £425 is £400, rounded to 1 s.f. Construct the estimated calculation \[425 \div 8.48 \approx 400 \div 8\] Consider units within a worded problem in context The question considered both numbers in pounds but the answer should be a whole number of toys. The estimate number of toys that could be bought is 50. If we compare this to the exact answer which is 50.1179… we can see that the estimated answer is an underestimate. . Write down an estimate for: Decide which square numbers are closest to 70 \[\begin{aligned} 7^{2}&=49 \\\\ 8^{2}&=64 \\\\ 9^{2}&=81 \\\\ 10^{2}&=100 \end{aligned}\] Decide which two squares 70 lies between and which one it is closest to 70 lies between 64 and 81 lies between \[\sqrt{64} \text { and } \sqrt{81}\] And \[\sqrt{64}=8, \sqrt{81}=9\] 70 is closer to 64, being 6 units away, than 81, being 11 units away So, is just under 8.5. Complete the calculation using estimation \[\sqrt{70} \approx 8.4\] Estimate the value of: \[\frac{804 \times 2.86}{0.513}\] Round numbers to one significant figure 804 is 800, to 1 s.f. 2.86 is 3, to 1 s.f. 0.513 is 0.5, rounded to 1 s.f. Construct the estimated calculation \[\frac{804 \times 2.86}{0.513} \approx \frac{800 \times 3}{0.5}\] Complete the calculation using estimation \[\begin{aligned} 800 \times 3&=2400 \\\\ \frac{2400}{0.5}&=4800 \end{aligned}\] If we compare this to the exact answer which is 4482.3 (1 d.p.) we can see that the estimated answer is an overestimate. It is common to find the actual calculation rather than use estimation Estimation relies on rounding to significant figures to simplify the calculation. An estimate of 5.8 × 2.3 is 12. The actual answer is 13.34. The first significant figure is the first non-zero digit E.g.The first significant figure of 0.00123 is the fourth digit which is 1. E.g.The first significant figure of 0.023 is the third digit which is 2. E.g.The first significant figure of 0.0000547 is the sixth digit which is 5 Dividing by a decimal gives a larger number E.g. Significant figures and decimal places Rounding to one decimal place relies on what happens after the first digit after the decimal point, whereas the first significant figure is the 1st non-zero number. It is important to have a strong understanding of place value to do this. E.g.Although 0.02 has 2 decimal places, the 2 is the 1st significant figure. We can also estimate with fractions by first converting the fraction to a decimal and then rounding the numbers to 1 significant figure. We can use graphs to estimate values by using a line of best fit and extrapolating. The word estimation comes from the Middle English word aestimatio which means a valuation. Remember to round each number to one significant figure, then calculate \begin{aligned} 7.2 \times 98 &\approx 7 \times 100\\\\ 7 \times 100 &= 700 \end{aligned} Remember to round each number to one significant figure, then calculate \begin{aligned} \frac{907}{3.02} & \approx \frac{900}{3} \\\\ \frac{900}{3} &=300 \end{aligned} We round the number of litres to one significant figure, and the price per litre to one significant figure. \begin{aligned} 7.4 \times 123 &\approx 7 \times 100 \\ 7 \times 100&=700 p \text { or } \pounds 7.00 \end{aligned} Remember to round each number to one significant figure, then calculate \begin{aligned} \frac{23 \times 494}{54} & \approx \frac{20 \times 500}{50} \\\\ \frac{20 \times 500}{50} &=\frac{10000}{50} \\\\ \frac{10000}{50} &=200 \end{aligned} Remember to round each number to one significant figure, then calculate \begin{array}{l} 1.84 \approx 2\\20 \div 2 = 10 \text{ packets} \end{array} Remember to round each number to one significant figure, then calculate \begin{aligned} \frac{600 \times 5}{0.5}&=\frac{3000}{0.5} \\\\ \frac{3000}{0.5}&=6000 \end{aligned} The nearest square numbers are 25 and 36 \sqrt{25}=5 \text { and } \sqrt{36}=6 so the estimate lies between both. 30 is slightly closer to 25 than 36 so an estimate will be 5.4 . 1. Anna says that: 472 \div 5 = 9.44 Use estimation to show that Anna cannot be correct. (3 Marks) 472 \approx 500 \\ (1) 500 \div 5 = 100 (1) The answer should be near 100 (1) 2. Oliver wants to buy the following items for his garden: 5 packs of turf at \pounds 91 per pack 30 paving slabs at \pounds 5.81 each 4 fruit trees at \pounds 16.50 each Estimate the total cost. (3 Marks) \pounds 91 \approx \pounds 90, \pounds 5.81 \approx \pounds 6, \pounds 16.50 \approx \pounds 20 (1) \begin{aligned} 5 \times \pounds 90 &= \pounds 450 \\30 \times \pounds 6 &= \pounds 180 \\4 \times \pounds 20 &= \pounds 80 \end{aligned} (1) \pounds 450 + \pounds 180 + \pounds 80 = £710 (1) 3. (a) Estimate: \frac{31 \times 3.96}{0.47} (b) Estimate: \sqrt{5.3 \times 8.9} (6 Marks) (a) \frac{31 \times 3.96}{0.47} \approx \frac{30 \times 4}{0.5} (1) \frac{30 \times 4}{0.5} = \frac{120}{0.5} (1) \frac{120}{0.5} = 240 (1) (b) \sqrt{5.3 \times 8.9} \approx \sqrt{5 \times 9} (1) \sqrt{5 \times 9} = \sqrt{45} (1) \begin{array}{l} \sqrt{36} = 6, \sqrt{49} = 7\\\\ \sqrt{45} \approx 6.7 \end{array} (accept 6.6-6.8) (1) You have now learned how to: Estimate by rounding using significant figures Estimate within the context of a worded problem, considering units Estimate using multiple steps Estimate considering BIDMAS principles Estimate using square roots Lowest common multiple Percentage multipliers Decimals Prepare your KS4 students for maths GCSEs success with Third Space Learning. Weekly online one to one GCSE maths revision lessons delivered by expert maths tutors. Find out more about our GCSE maths tuition programme. We use essential and non-essential cookies to improve the experience on our website. Please read our Cookies Policy for information on how we use cookies and how to manage or change your cookie settings.AcceptPrivacy & Cookies Policy An estimate is a technique to calculate the quantities of various items of work, and the expenditure likely to be incurred thereon. The total of these approximate expenses to be incurred on the work is known as the estimated cost of the work. The approximate cost of a work is a close approximation of its actual cost. There are 12 Types of Estimates in civil engineering Approximate or Rough Estimate, Plinth Area Estimate, Service Unit Method, Floor Area Method, Carpet Area Method, Typical Bay Method, and Cost Comparison Method. Estimation is the technique of estimating the various quantities of work and the expected expenses to be incurred on a particular work or project to execute. In case the funds available are less than the estimated cost the work is executed in part or by reducing it or specifications are altered. Estimation gives an approximate idea of the time required for the completion of the work. The estimate is required to invite the tender and quotations and to arrange a contract. The estimate is also essential to control the expenditure during the execution of work. An estimate decides whether the proposed plan matches the funds and budget available or not. The rate used in the estimate should check with the current standard schedule of rates (SOR) & in the case of quantity, it should check with the standard data book. Read More: Types Of Cost Estimates In Project Management The followings are Types of Estimates in Construction This type of estimate is also called the budget, a preliminary estimate. This preliminary estimate is prepared in the initial stage of the project to give a clear idea to the client about the funds needed for the project and to get approval from necessary sanctioning bodies (for example: to get loans from banks). Documents like project drawing plans, details about the land including electricity & water supply system and sanitary system a full clear report are necessary for the previous experience. Eg: To calculate the estimate for a house, a previously completed similar house will be considered. Here the estimator already knows the rate for 1m2 areas & with that he/she calculates the cost estimate for the newly proposed area of a similar house. Approximate estimate = Rate of 1m2 area(already known value) x Proposed area (m2) The preliminary estimate may be prepared in various ways for different work and structures as: A) For Building: Service unit method Plinth area method Floor area method Carpet area method Cubical content method Typical bay method Approximate quantity method B) For Road and Highways: For roads and highways, it is calculated per kilometer basis depending on the nature of the road, width, thickness of metaling, etc. For 10 km of a state highway, the approximate cost is Rs.6,00,000/- per km. Total Cost = 10 x 6,00,000 = 60,00,000 Rs. = Rs. 60 lakh C) For Irrigation Canals: The cost of the Irrigation canal is calculated per kilometer basis depending on the capacity of the channel. The approximate cost of a 10 km length of irrigation channel of 3 cubic meters per sec capacity @ Rs. 1,00,00 per km. Total cost = 10 x 1,00,00 =10,00,00 Rs = Rs. 10 lakh. C) For Bridge: The cost of the bridge is calculated per running meter of span depending on the roadway, nature, depth of foundation, types of structure, etc. The approximate cost of a bridge o 4 spans of 50 m each span @ Rs. 50,000 per running meter of the span is Total cost = (4×50) x 50,000 = 1,00,00,000 = Rs. 1 crore E) Water Supply and Sewerage Project: It cost is calculated per head of population served. Approximate cost of water supply for a population of 80,000 @ Rs. 100 per head comes to 80,000 x 100 = 96 lakhs. F) Over Head Water Tank: Its cost is calculated on basis of the capacity per liter of the tank depending on the type of structure, the height of the tank, etc. Approximate cost of an overhead RCC tank of 1 lakh liter capacity @ Rs. 3 per liter works out to be 1,00,000 liter x 3 = Rs. 3 lakhs. In this type of estimate, the plinth is found by multiplying the values of the length of the plinth, the width of the plinth, and the plinth area rate. Here the plinth area is referred to as the external plinth area of the building at floor level. Simply it can be also stated as the roof-covered area of the building. The plinth area rate is derived by dividing the total cost of a previously constructed building by the plinth area method. Documents such as a line plan with complete specifications & costs for services such as water, and electricity should be attached with the plinth area estimate. Plinth area estimate = Plinth area x Plinth area rate Plinth area = Plinth length x Plinth width Plinth area rate = Total cost of a previously built building / Total plinth area of the building. In this method cost of a 1 m3 area is calculated from the cost of similar plinth area construction in the nearby area which is known as the plinth area rate. Estimate cost = Plinth area x plinth area rate for 1 m2 area For Example, A building has a plinth area of 200 m2 and the plinth area rate in this area s Rs. 3500/- per m2. Estimated cost = 200 x 3500 = 7,00,000 Rs There are some restrictions in calculating the plinth area of a building project and some areas have to include or exclude when calculating the cost. Among that, areas include are, a floor area with an area of walls at floor level excluding the offsets of the building, internal shafts of sanitary fittings within 2m2, lifts, air conditioning ducts, an area of the porch at floor level, a room on the terrace or rooftop with verandah outside. Areas that can't include are an area of lofts, open balconies/un-enclosed balconies, and fascia, towers that project above terrace level, louvers & vertical sun breakers. Read More: Building Estimation Excel Sheet Free Download In the Service Unit Method, the Service Unit indicates the most important unit in a structure. The entire structure is divided into a number of service units. For example, in a school building, the service unit is in the classroom. Then, the approximate cost of structure = Number of service units in the structure x cost of service units in a similar existing structure. The approximate estimate of the school building is prepared on the basis of the service unit and the service unit for the school building is the classroom. The service units for various structures are given in the below table. Sr. No.Types of ConstructionService unit1.School, CollageClassroom2.HospitalsBed3.HostelStudents4.HotelRoom5.Theatre(Cinema)Seat6.StadiumSeat7.JailKotani8.StableAnimal9.Water TankLitre10.DamHectare Meter11.Water Supply SchemePerson12.RoadKilometer13.CanalKilometer14.BridgeMeter15.Power StationKilowattTypes of Construction and Their Service Unit (Service Unit Method) While Deciding on a service unit of similar construction the following points should be noted. 1) Change in cost of land 2) Change in the price level of different materials. 3) Change in rate of labor. 4) Change in the specification of construction. This type of estimate is generally used in places where units are easily defined. The floor area is calculated by deducting the area of the wall from the plinth area. Floor area = Plinth area – Area of wall In the calculation of the area of walls, the thickness of the wall shall be inclusive of finishes and dado if the height of such finish is more than 1 m from the floor finish. The following points must be included in the wall area: i) Door area another opening in the wall. ii) Built-in cupboard, almirah, etc. appearing within a height of 2.2 m from the floor. iii) Flues that are within the wall. Example, Estimate cost = Floor area x Floor area rate Let, one building gas floor area of 100 m2, and the floor area rate is 4000 Rs. Estimated Cost = 100 x 4000 = 4,00,000 Rs. The carpet area is the floor area less the area of the followings portions (as per IS 3861) Verandah Corridor, Passage Entrance hall and Porch Staircase Bathroom and W.C. Kitchen and Pantry Store, Machine Room for lift Shaft for sanitary pipes etc. Estimated Cost = Plinth area x plinth area rate This method is useful in the case of a building that has several similar bays. A bay is a space from the center to the center of two successive columns. A typical interior bay is selected and its total cost is worked out. Then, Approximate cost of proposed building = numbers of bays x cost of one bay The following points are to be noted: Necessary corrections should be made for end bays due to end walls. Sufficient allowance should be made to compensate for the small things that are overlooked. This method is suitable for the estimate of the prototype structure. For example when prototype staff quarters or railway stations etc, are required. to be estimated approximately then the estimate for such prototype work is prepared by comparing the previous cost with the present market rates, normally by increasing the past cost on a percentage basis. Such an estimate can be prepared in a short time even during meetings also.But expert knowledge is necessary to estimate the present cost of construction as compared to previously recorded costs. Read More: Valuation Of Building And Methods Of Valuation Of Property 8. Cubic Content Method In this method estimate is done by multiplying the volume of the unit cubic rate achieved from the previously (also recent) estimate. The cubic Content Method is a little bit more accurate than the above-mentioned methods and mostly suitable for multi-storied buildings. The price of corbelling (corbel-a piece of broken stone, wood, brick, or any building material, projecting from the face of a wall and generally used to support a cornice or arch, etc), cornice, and other works like that are neglected. Cubic content estimate = Volume of the building or structure x Unit cubic rate (original value) The volume of the building = Plinth area (length x breadth of the proposed building) x Height of the building (floor to rooftop) Unit cubic rate = Total cost of the previously constructed building / Total volume of that building It is used for annual repair estimates or special repair estimates. These estimates are prepared for the purpose to maintain the constructed element in good condition. Works that included when considering repair works, whitewashing, painting, plastering works, patching works, sanitary works, etc. A special repair estimate is prepared in a situation where the costs of materials increased when compared to the annual repair estimate cost. A revised estimate is prepared when the cost of the previously submitted estimate increases by 5-7% or more than that. But here the reason for calculating the estimate must have a strong & valid reason like a sudden increase in the cost and expenses of materials. The reason and comparative statement between the two estimates should be annexed with a revised estimate. This type of estimate is prepared when there is a necessary situation for supplementary works, to progress out the original work. The annexure of the originally prepared estimate and supplementary amount of the originally prepared estimate when submitting for requesting approval. It is the most important type of estimate for building construction. A detailed estimate is prepared with the help of a complete set of contract documents. The preparations of the detailed estimate can do under 2 phases such as working out quantities of different works and calculating the cost of each work. a) Work out with quantities of different work: The whole construction work procedure is divided into categories such as excavation and earthwork, concrete work, formwork, reinforcement, masonry work, roof covering and roof plumbing, carpentry, painting and decorating, plumbing, electrical installation, etc. Decoration of the approximate estimate depends upon the area to be decorated. The measurement-taking procedure is done with the help of drawings/plans and then they are entered into the measurement. A measurement is a form that contains a number of columns to enter the respective measurements and descriptions of the works. Finally, the measurement columns are multiplied to get the necessary quantity. b) Calculation of the cost of each work: The already obtained quantities are used to get the cost of each work. Estimated costs of each work item are summarized in ascending order and that document is called the Abstract sheet. Detailed types of estimates should include all the related documents such as reports, specifications, drawings & plans, design charts, and schedule of rates(SOR). There are various factors that affect the cost of each work such as material quantity, transportation of materials, location of the site, labor charges, cost of equipment (commonly allowed 2% of the estimated cost), overhead charges (commonly allowed 2.5% of the estimated cost), contingencies and unforeseen (commonly allowed 4-5% of the estimated cost) items are needed to consider well while preparing the detailed estimate. (Types of Estimates in construction) An estimate is a calculation of the approximate cost or quantity of something, such as a project, product, or service. It is an educated guess based on available information. A preliminary or approximate estimate is an early estimate of the cost of a project, based on limited information and assumptions. It is often used to help determine the feasibility of a project and to obtain initial funding. A unit rate estimate is an estimate based on the cost of a specific unit, such as a cubic yard of concrete or an hour of labor. It is often used in projects where the quantities of materials and labor are known. A negotiated estimate is an estimate that is negotiated between the contractor and the client, based on a detailed scope of work and other factors. It is often used in projects where the client has specific requirements or preferences. You Might Also Like: Estimate method: It gives the approximate cost of the work and is prepared on the basis of the cost of similar works carried out in the past. Approximate estimate is preliminary or rough estimate. It is used to find out an approximate cost in a short time and thus enable the responsible authority concerned to consider the financial aspect of the scheme for sanction to the same. Such approximate estimates are prepared using different methods for different types of works. Purpose of Approximate Estimate Method: To investigate feasibility, save time and moneyTo investigate benefit t with utilityAdjustment of planningTo obtain administrative approvalFor insurance and tax schedule Methods of Approximate Estimate: Plinth area methodCubic rate methodApproximate quantities with bill methodService unit method 1. Plinth area method: To prepare an estimate by this method the plinth area of the building shall be determined first. Plinth area may also have to be worked out from the floor area or carpet area of the building. 2. Cubic rate method: The cubic rate for estimating a building is more general than the plinth area method because cost of building depends not only on plinth area but also on volume of building. 3. Approximate quantities with bill method: Multiply the total length of wall of building in running meter by cost of construction per meter length of such wall. Total length of the wall building is worked out from the plan. 4. Service unit method: In this method all costs of unit quantity such as per km of for highway per meter of span for bridge per classroom for school buildings per bed for hospital per litre of water tank etc. Interested in learning about similar topics? Here are a few hand-picked blogs for you! In construction, an approximate estimate is a rough calculation made early in the project to determine its potential cost. It is usually performed before final specifications or designs are selected, providing a quick approximation for decision-making and planning. Also known as preliminary or rough estimation, this process helps stakeholders get an initial understanding of the project's financial scope without detailed designs.What Is Approximate Estimate?An approximate estimate is prepared to quickly determine a rough cost before the project begins. It is done before final specifications and designs are chosen. This method is often referred to as a preliminary estimate or rough estimate.Purpose of Approximate EstimateQuick Cost Evaluation: Provides an estimate of the project's cost within a short time frame.Comparing Options: Helps assess cost differences between multiple design or material options.Baseline for Final Estimate: Offers a rough benchmark to compare against the detailed, final cost estimation.Methods of Approximate EstimateA. Square Metre or Plinth Area MethodThis method estimates the cost based on the area of the building, calculated in square meters. It is particularly useful for office buildings, residential buildings, school buildings, apartments, and hospitals.For multi-storeyed buildings, the following considerations are used:The cost per square meter is applied uniformly to all floors, including the basement and roof.Basement Cost: 60% of the cost of the floors.Roof Cost: 40% of the cost of the floors.This method is often preferred for new buildings due to its simplicity and effectiveness in quick cost estimation.B. Cubic Rate or Cubic Meter MethodThe cubic meter method offers more accurate results than the square meter method, especially for multi-storeyed buildings. Here, the cost is based on the volume of the building rather than just the area.Assumptions for multi-storeyed buildings:The cost for 1 cubic meter of area is the same across all floors.Basement Cost: 60% of the cost of the floors.To calculate the volume, the formula is: Volume = Area × Height of One FloorFloor heights are calculated as follows:Ground Floor: From the top of the footing to the middle of the parapet.First Floor: From the ground rooftop to the middle of the parapet.Other Floors: From floor to floor.This method is useful for buildings with varying floor heights, providing more accurate cost estimates.Other Rough Estimation MethodsIn addition to the Square Metre and Cubic Meter methods, several other techniques can be used to generate approximate estimates:Cost Comparison Method: Compares the project with similar past projects to estimate costs.Unit Rate Method: Estimating costs based on unit rates for specific construction activities.Approximate Quantities with Bill Method: Based on approximate quantities of materials and labour required.Bay Method: Breaks down the project into "bays" or sections, estimating the cost for each.Cost of Materials and Labour Method: Estimates based on the cost of materials and labour involved.Here are some additional topics you can incorporate into your blog on Approximate Estimates in construction to make it more comprehensive:1. Importance of Approximate Estimates in Early Project StagesHow approximate estimates help in determining project feasibility.Their role in securing project funding or approval from stakeholders.The significance of approximate estimates for clients and contractors in setting expectations.2. Factors Influencing Approximate EstimatesLocation: How geographical differences can impact the overall cost estimate.Material Prices: Variations in the cost of materials and how they affect estimates.Labour Costs: The impact of skilled and unskilled labour rates on rough cost predictions.Timeframe: The influence of project duration on the cost, especially for time-sensitive projects.3. Advantages of Using Approximate EstimatesSpeed and Efficiency: Why approximate estimates are a quick way to get a project off the ground.Cost Control: Helping to keep budgets in check and manage overall project costs.Initial Planning: Aiding in the early phases of project management, such as determining project size and design choices.4. Challenges and Limitations Inaccuracy: Why approximate estimates are not always 100% reliable.Changing Conditions: How shifting market conditions or unforeseen circumstances can affect initial cost predictions.Complexity: When complex designs or unusual materials require more precise estimation methods.5. Refine Approximate Estimates The process of refining rough estimates as more detailed information becomes available.Transitioning from preliminary estimates to final detailed estimates based on finalized designs, specifications, and materials.6. Role of Technology The influence of modern software tools and estimation apps on generating more accurate preliminary cost predictions.Use of BIM (Building Information Modelling) and other digital tools for better approximations.7. Common Mistakes to Avoid Overlooking hidden costs such as permits, taxes, or site preparation.Underestimating the effect of design complexity on costs.Misjudging material quality or availability.8. Case Studies: Real-World Applications of Approximate EstimatesExamples of successful projects where approximate estimates helped streamline the process.Instances where inaccurate rough estimates led to cost overruns and how they were managed.9. Key Takeaways for Using Approximate EstimatesTips for contractors and project managers on when to use approximate estimates and how to manage them effectively.The importance of reviewing and updating estimates as the project evolves.Incorporating these topics into your blog will provide a well-rounded discussion on approximate estimates, their importance, methods, and practical applications in construction.ConclusionAn approximate estimate is a vital tool in the initial stages of a construction project. It offers a quick and reasonably accurate cost projection, allowing stakeholders to make informed decisions early on. Various methods, such as the Square Metre, Cubic Meter, and other techniques, each have their specific uses depending on the project's nature. Understanding and applying the right method for estimation can help streamline planning and budgeting in construction projects. This approximate estimate is prepared for preliminary studies of the work's various aspects and to decide the financial position and policy for administrative approval by a competent sanctioning authority. In the case of commercial projects such as residential buildings, irrigation and power projects that earn revenue, the probable income is also mentioned, and the investment in the project is justified. Suppose the project is non-commercial, having no direct return. In that case, its necessity, utility, prospects in future and availability of finance are considered before the final decision is taken. This estimate is prepared based on practical experience of carrying out similar works in the past and their rates. In this estimate, the approximate cost of all important works, such as the cost of land, roads, buildings, water supply, sanitary works, electrification etc., is mentioned separately. A brief report of the project indicating its necessity, utility and method of arriving at the cost of each item and the site or layout plan is also enclosed with the estimate. Experimental or approximate construction cost estimation methods for studies of various aspects of the project's work and its administrative approval are discussed. This estimate can decide, in the case of commercial projects, whether the net income earned justifies the amount invested or not. The approximate estimate is prepared from the practical knowledge and cost of similar works. The estimate is accompanied by a report duly explaining the project's necessity and utility and a site or layout plan. A percentage of 5 to 10% is allowed for contingencies. The following are the methods used for the preparation of approximate construction cost estimates: Plinth area method Cubical contents method Unit base method Approximate Quantity Method 1. Plinth area method The construction cost is determined by multiplying the plinth area by the plinth area rate. The area is obtained by multiplying length and breadth (outer dimensions of the building). In fixing the plinth area rate, careful observation and necessary inquiries are made in respect of quality and quantity aspects of materials and labour, type of foundation, the height of building, roof, woodwork, fixtures, number of stories, etc. As per IS 3861-1966, the following areas include while calculating the plinth area of the building: a. Area of walls at floor level. b. Internal shafts of sanitary installations not exceeding 2.0 sqm, lifts, air-conditioning ducts, etc., c. area of barsati at terrace level. Barsati means any covered space open on one side, constructed on one side, constructed on the terraced roof, which is used as shelter during the 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 louvres and vertical sun breakers. 2. Cubical Contents Method This method is generally used for multi-storeyed buildings. It is more accurate than the other two methods, the plinth area method and the unit base method. The cost of a structure is calculated approximately as the total cubical contents (Volume of buildings) multiplied by the Local Cubic Rate. The volume of the building is obtained by Length x breadth x depth or height. The length and breadth are measured outside walls, excluding the plinth offset. The cost of string course, cornice, corbelling, etc., is neglected. The cost of building = volume of buildings x rate/ unit volume. 3. Unit Base Method According to this method, the cost of the structure is determined by multiplying the total number of units by the unit rate of each item. In the case of schools and colleges, the unit is considered to be 'one student, and in the case of a hospital, the unit is 'one bed'. The unit rate is calculated by dividing the actual expenditure or cost of a similar building nearby by the number of units. 4. Approximate Quantity Method This method divides the structure into the Foundation Inclusive of Plinth and the Super Structure. The cost per running meter of the foundation, including the plinth, is worked out and multiplied by the total length of the foundation to determine the total cost of the foundation. Similarly, the cost per running meter of the superstructure is found. It is multiplied by the total length of all the superstructure walls to get the total cost of the superstructure. The total cost of the structure is then obtained by adding the total cost of the foundation, including the plinth, to the total cost of the superstructure. A line plan of the proposed structure is required for the above computations. Purpose of, and Approach to, Approximate Estimating The primary function of approximate or preliminary estimating is to produce a forecast of the probable cost of a future project, before the building has been designed in detail and contract particulars prepared. In this way the building client is made aware of his likely financial commitments before extensive design work is undertaken. Experts regard the intrusion of quantity surveyors with adequate techniques into the estimating field as of considerable significance in the development of a professional role. To extend this role into that of building economist requires the development of understandings and techniques of a kind that will deal, not just with the items which go into the accountancy of a particular building, but with the forces, economic and other, which have determined the nature and relationships among those quantities and costs, and which determine the trends they show. Indeed, economics is the study of all the forces which determine the present functioning and probable future trends of a whole industrial or financial system. The quantity surveyor performs an extremely important role in cost assessment, giving advice as to the probable cost of a particular design proposal and variations to it, and suggesting how similar objectives could be achieved more economically. It must, however, be emphasised at the outset that no approximate estimate can be any better than the information on which it is based. Indeed, realistic approximate estimating can be achieved only when there is full co-operation and communication between architect, quantity surveyor and building client from the inception of the scheme. It is advisable to dissuade the architect from reporting forecasts of costs to the building client until some drawings, even preliminary sketches, have been prepared and an inspection made of the site. There is a distinct possibility that the building client will endeavour to obtain an independent check on the preliminary cost figures and it is accordingly unwise to supply a high 'cover' figure. On the other hand the submission of too low a figure can lead to recriminations, as the first figure is the one that the building client will always remember. The quantity surveyor should always emphasise that an estimate based on inadequate information cannot be precise, and in such a situation he would be well advised to give a range of prices, as an indication of the lack of precision that is obtainable. The choice of method employed will be influenced by the information and time available, the experience of the surveyor and the amount and form of the cost data available to him. It is essential to carry out a detailed site survey before a preliminary estimate is prepared as it would be quite unrealistic to assume that the site is level, and free from obstructions, has a water table well below foundation level, and that the soil has an average load-bearing capacity. Similarly, old drawings of existing buildings scheduled for adaptation need checking. Classification of Approximate Estimating Procedures Various precontract approximate estimating methods can be classified as follows. Single-purpose estimates are aimed at forecasting cost and these can be further subdivided into preliminary estimates, which establish the broad financial feasibility of the project, and later stage estimates which will produce a figure comparable with that of the lowest tender. Dual-purpose estimates are aimed at determining total costs and also the various design-cost relationships between possible variants of the projects. These estimates delve into the wider field of cost planning. The second category of estimates can be divided into two groups: primary comparative-cost estimates, which indicate the relative costs of different design solutions which will satisfy the requirements of the building client, and secondary comparative-cost estimates which apply the financial yardstick to alternatives of construction, finish and service installations applicable to the selected design. The extent to which these various estimating processes are needed for a given project is very much dependent upon the degree of importance with which the building client views financial considerations and the size of the project. For instance, buildings let to third parties, which must show a profitable return on their capital cost and owner-occupied industrial and commercial projects where capital is limited, all need to be exhaustively and skilfully costed at each stage of development of the design. The main problems in implementing each of the main categories of approximate estimating are now considered. Single-purpose preliminary estimates. These are often required before any drawings are prepared and are frequently computed by rather imprecise methods. These methods include unit prices such as the comprehensive price per bed of a hospital or hotel, and an ali-in price per cubic metre of a building, whose location, shape, height, site works, services and other important characteristics may not have been determined at the time the estimate is required. These estimating methods are difficult to apply and should be used with the greatest care. Single-purpose later stage estimates. These should only be prepared by single price-rate methods if the quantity surveyor is very experienced in the use of these methods, or if he has available as a starting point the tender particulars of a recent project which is similar in character and preferably designed by the same architect. In all other circumstances it is better to prepare estimates of this kind by way of priced approximate quantities which is a much more accurate method of estimating. In addition the total estimate can be broken down into convenient parts and justified if required, a process which is hardly feasible with single price-rate methods. Primary comparative-cost estimates often use single price-rate methods as a basis for the computations. Nevertheless, it is important to make allowances for differing shapes and wall-to-floor ratios of alternative designs. External walling is expensive and, as a general rule, the smaller the ratio of external walling to floor area, the cheaper will be the building. The aim should be to use rectangular buildings with the sides as near equal in length as possible, provided that other aspects such as lighting and ventilation can be dealt with satisfactorily. Similarly, it is usually more expensive to construct accommodation vertically instead of horizontally at the stage when it becomes necessary to provide a structural frame, probably at the two-storey stage in the case of a heavily loaded building, and three to five-storeys with lightly loaded ones. Secondary comparative-cost estimates are an integral part of cost planning, in comparing the costs of possible variants in construction, finishing and servicing of the selected plan. Comparisons could be made between traditional and nontraditional construction; steel frame, reinforced concrete frame and load-bearing brickwork; various types of pitched and flat roofs; different floor, wall and ceiling finishings; and different forms of heating and lighting. In all cases the drawing numbers on which the estimate is based should be recorded on the estimate. The date of the estimate and the allowance for price fluctuations between the estimate and tender dates should also be clearly shown