RRB JE CBT 2

Marathon Class

Estimation & Costing

MCQ's के साथ

● LIVE

पूरी तैयारी Class में ही

wifistudy

Changing the way of learning...

ESTIMATION AND COSTING

Civil Engineering by Sandeep Jyani

MONEY TIME and RESOURCES ?

QUANTITY SURVEY

- Quantity survey means calculations of quantities of materials required to complete the work concerned

SPECIFICATIONS

- Detailed specifications gives the nature, quality and class of work, materials to be used in the various parts of work , quality of the material, their proportions, method of preparation, workmanship and description of execution of work are required.

SITE PLAN

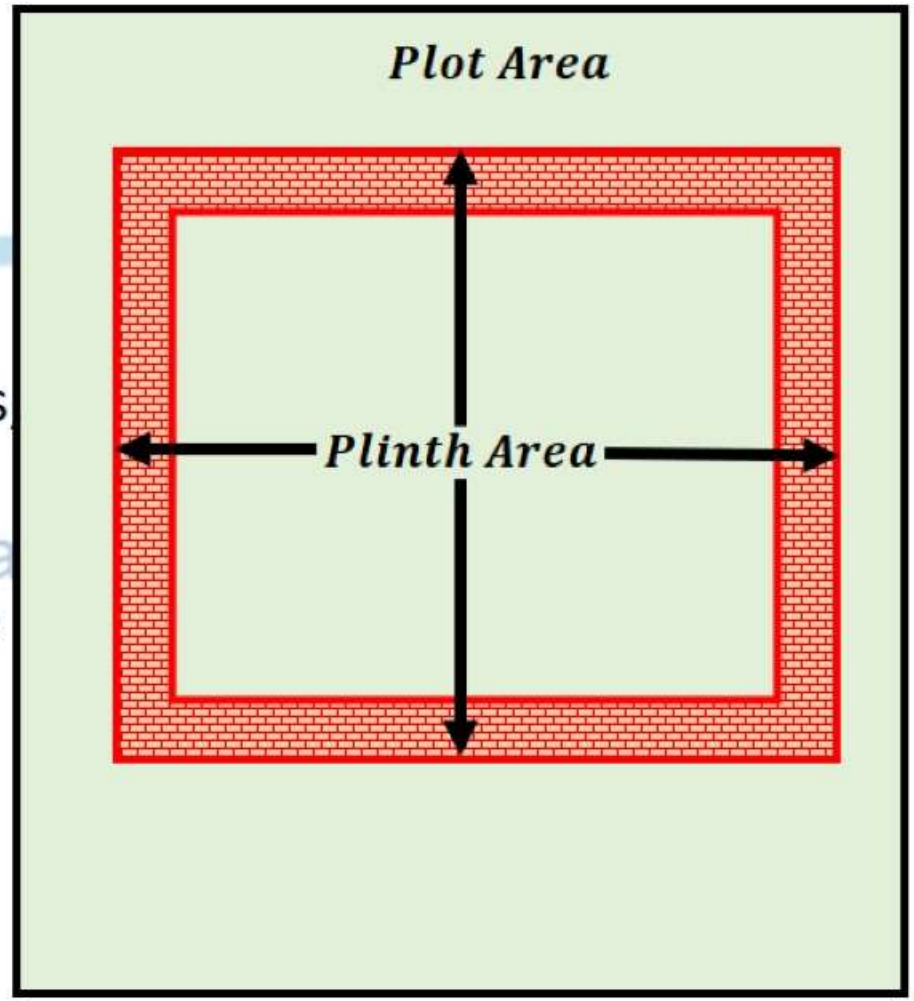
- It is the plan drawn for a particular construction showing its position with respect to approaching roads, main markets and other permanent features in a populated area.

Some Important Terms

1. Plinth Area:
   - The built-up covered area of a building measured at floor level of any storey is called Plinth area

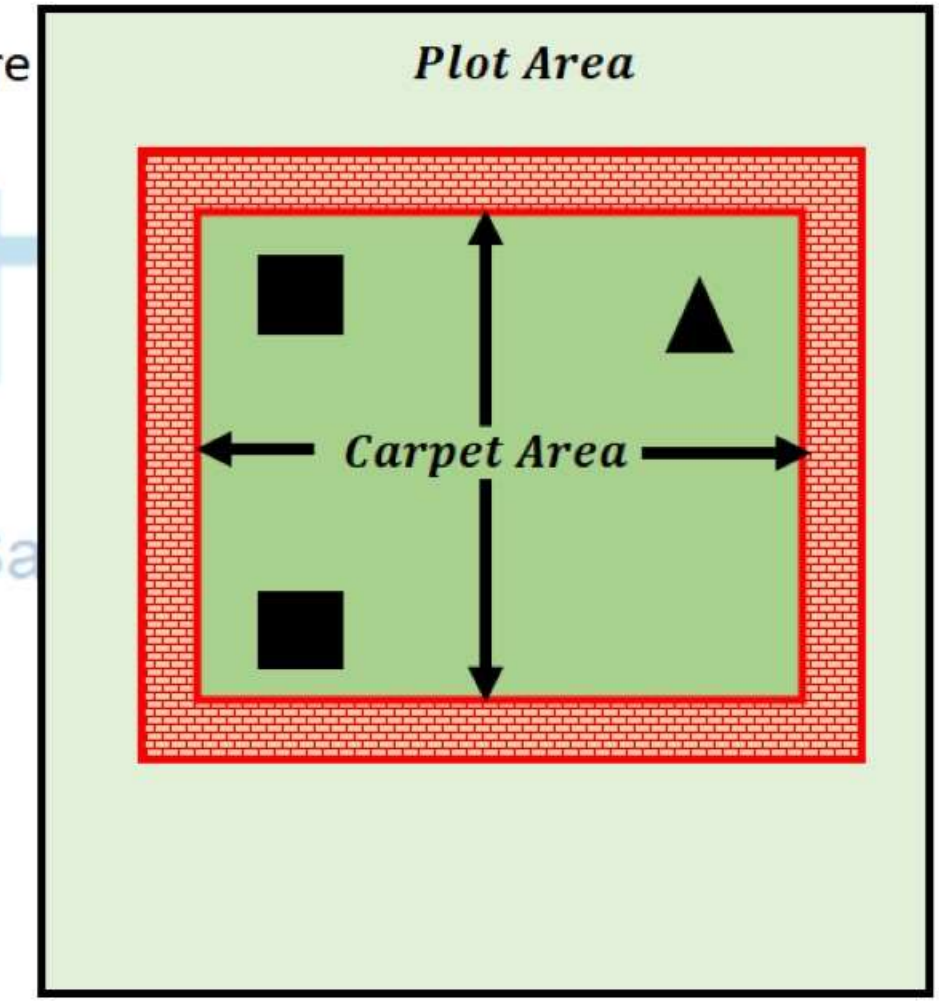
   ✓Wall area, porch, internal shaft(<2m^2), ducts, lift, Staircase room, Machine room etc are included

   ❖Cantilever porch, external staircase, Terrace at first floor, Additional floor for seating in assembly buildings, theatres, auditoriums



2. **Carpet area** the covered area of the usable spaces of rooms at any floor. It is measured between walls to walls within the building

- It is the sum of the actual areas of the rooms where you can carpet.
- Following areas are not included in Carpet area:
  1. Wall area
  2. Veranda
  3. Corridor and passage
  4. Entrance hall and porch
  5. Staircase and stair cover
  6. Lift shaft and machine room for lift
  7. Bathroom and lavatory
  8. Kitchen and pantry
  9. Store
  10. Canteen
  11. Air conditioning duct and plant room
  12. Shaft for sanitary piping
  13. Stilted floor and garage



3. Floor Area

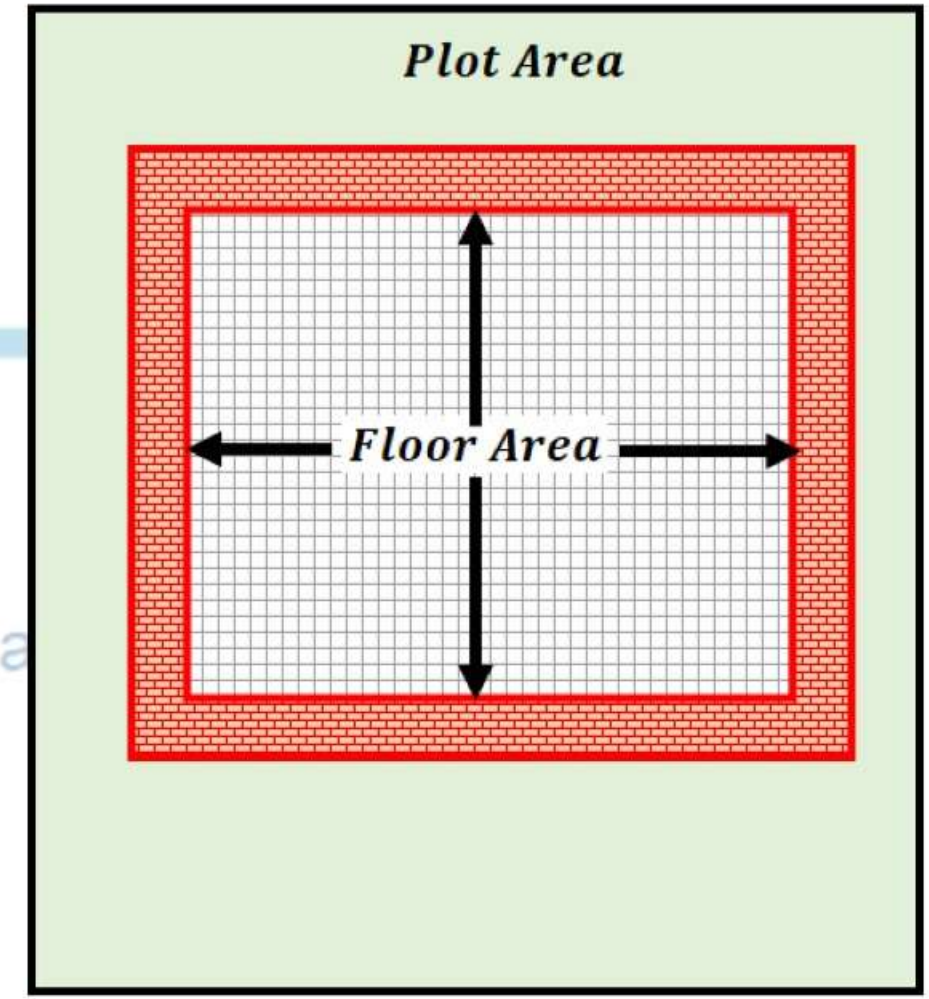
- $Plinth\ area - area\ of\ walls$

4. Set Back Area

- Setback can be explained as the minimum open space required around any building or structure.
- Municipal regulations make it mandatory for a specific distance to be maintained between a building and the boundary of the plot on which the building is being constructed on, in order to keep it away from roads, water bodies or other buildings

5. Circulation Area

- Area that is helpful in movement of people through, around and between buildings and other parts of the built environment
- Lobbies, corridors, stairs, lift, landings, etc.



Que 1. What Is the Floor Area Ratio (FAR)?

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Answer:

The floor area ratio (FAR) is the relationship between the total amount of usable floor area that a building has, or has been permitted to have and the total area of the lot on which the building stands. The ratio is determined by dividing the total or gross floor area of the building by the gross area of the lot.

$$Floor\ Area\ Ratio = \frac{Total\ Building\ Floor\ Area}{Gross\ Plot\ Area}$$

Que 2. What is the FAR for a single storey building with plot area 1000sqm and floor area 500sqm?

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Answer:

$$Floor\ Area\ Ratio = \frac{Total\ Building\ Floor\ Area}{Gross\ Plot\ Area}$$

$$Floor\ Area\ Ratio = \frac{500}{1000}$$

$$Floor\ Area\ Ratio = 0.5$$

Que 3. What is the FAR for a four storey building with plot area 4000sqm and floor area 500sqm?

Answer:

Que 3. What is the FAR for a four storey building with plot area 4000sqm and floor area 500sqm?

Answer:

$$Floor\ Area\ Ratio = \frac{Total\ Building\ Floor\ Area}{Gross\ Plot\ Area}$$

$$Floor\ Area\ Ratio = \frac{4 \times 500}{4000}$$

$$Floor\ Area\ Ratio = 0.5$$

ESTIMATION

- 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 available are less than the estimated cost, the work is done in part or by reducing it or by altering specifications, the following requirements are necessary for preparing an estimate.
  - Drawings like plan, elevation and sections of important points.
  - Detailed specifications about workmen ship & properties of materials etc.
  - Standard schedule of rates of the current year.

NEED FOR ESTIMATION

1. Estimate gives an idea 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 for the completion of the work.
3. Estimate is required to invite the tenders and quotations and to arrange contract.
4. Estimate is also required to control the expenditure during the execution of work.
5. Estimate decides whether the proposed plan matches the funds available or not.

PROCEDURE/METHOD OF ESTIMATING

Estimating involves the following operations

1. Preparing detailed Estimate.

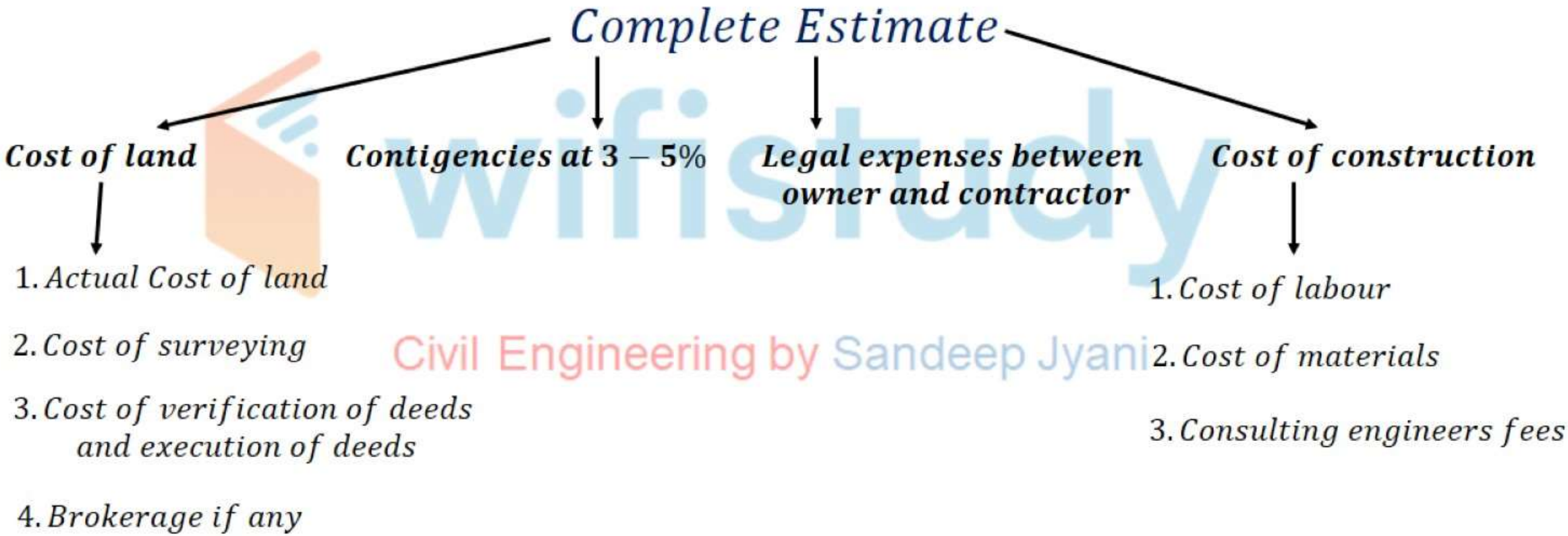
2. Calculating the rate of each unit of work

3. Preparing abstract of estimate

DATA REQUIRED FOR PREPARING ESTIMATE

1. **Drawings**
   - If the drawings are not clear and without complete dimensions the preparation of estimation become very difficult. So, it is very essential data required for estimate
2. **Specifications**
   - General Specifications: This gives the nature, quality, class and work and materials in general terms to be used in various parts of work. It helps to form a general idea of building.
   - Detailed Specifications: These gives the detailed description of the various items of work laying down the quantities and qualities of materials, their proportions, the method of preparation, workmanship and execution of work.
3. **Rates**
   - For preparing the estimate the unit rates of each item of work are required.
     a) For arriving at the unit rates of each item.
     b) The rates of various materials to be used in the construction.
     c) The cost of transport materials.
     d) The wages of labour, skilled or unskilled of masons, carpenters, Mazdoor, etc.

COMPLETE ESTIMATE



WORK CHARGED ESTABLISHMENT

- During the construction of a project considerable number of skilled supervisors, work assistance, watch men etc., are employed on temporary basis.
- The salaries of these persons are drawn from the L.S. amount allotted towards the work charged establishment. that is, establishment which is charged directly to work. a L.S. amount of 1½ to 2% of the estimated cost is provided towards the work charged establishment.

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 (8%)
  2. Electrical installations (8%)
  3. Architectural features.
  4. Contingencies and unforeseen items (3-5%).
  5. Work charge Establishments
- In general, certain percentage on the cost of estimation is allotted for the above L.S. Items.
- Even if sub estimates prepared or at the end of execution of work, the actual cost should not exceed the L.S. amounts provided in the main estimate.

MEASUREMENT OF MATERIALS AND WORKS

- The units of measurements are mainly categorized 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:

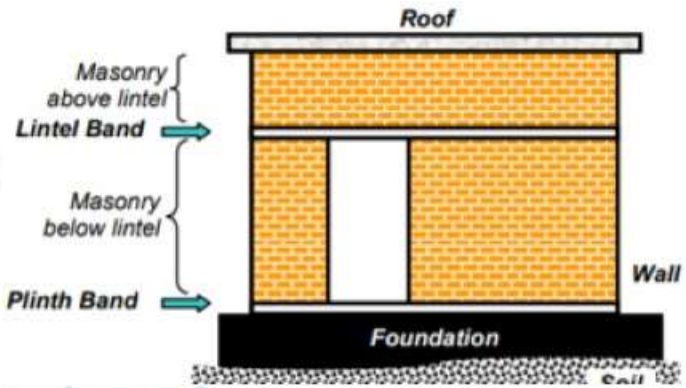
a) Single units work like doors, windows, trusses etc., are expressed in numbers.

b) Works consists linear measurements involve length like cornice, fencing, hand rail, bands of specified width etc., are expressed in running metre (RM)

c) Works consists areal surface measurements involve area like plastering, white washing, partitions of specified thickness etc., are expressed in square meters (m^2)

d) Works consists cubical contents which involve volume like earth work, cement concrete, Masonry etc. are expressed in Cubic metre.

Cornice



The bands are provided to hold a masonry building as a single unit by tying all the walls together, and are similar to a closed belt provided around cardboard boxes

Sr No.	Particulars of item	Units of Measurement	Units of payment
I	**Earth work:**		
	1. Earth work in Excavation	cum	Per%cum
	2. Earthwork in fillingin founda tion trenches	cum	Per%cum
	3. Earth work in filling in plinth	cum	Per%cum
II	**Concrete:**		
	1. Lime concretre in foundation	cum	percum
	2. Cement concrete in Lintels	cum	percum
	3. R.C.C.in slab	cum	percum
	4. C.C. or R.C.C. Chujja, Sun- shade	cum	percum
	5. L.C. in roof terracing (thickness specified)	sqm	persqm
	6. Cement concrete bed	cum	percum
	7. R.C. Sunshade (Specified Width & Height	cum	1rm
III	**Damp ProofCource (D.P.C)**	sqm	persqm
	(Thickness should be mentioned)		
IV	**Brick work:**	cum	percum
	1. Brickwork in foundation	cum	percum
	2. Brick work in plinth	cum	percum
	3. Brick work in super struc- ture	cum	percum
	4. Thin partition walls	sqm	percum
	5. Brick work in arches	cum	percum
	6. Reinforced brick work (R.B.Work)	cum	percum
V	**Stone Work: Stone masonry**	cum	percum
VI	**Wood work:**		
	1. Door sand windows frames or chowkhats, rafters beams	cum	percum
	2. Shutters of doors and win- dows (thickness specified)	sqm	persqm
	3. Doors and windows fittings (like hinges, tower bolts, sliding bolts, handles)	Number	per number

VI	**Wood work:**		
	1. Door sand windows frames or chowkhats, rafters beams	cum	percum
	2. Shutters of doors and win- dows (thickness specified)	sqm	persqm
	3. Doors and windows fittings (like hinges, tower bolts, sliding bolts, handles)	Number	per number
VII	**Steel work**		
	1. Steel reinforcement bars etc in R.C.C. and R.B.work. quintal	Quintal	per quintal
	2. Bending, binding of steel Reinforcement	Quintal	per quintal
	3. Rivets, bolts, & nuts, An- chor bolts, Lewis bolts, Holding down bolts.	Quintal	per quintal
	4. Iron hold fasts	Quintal	per quintal
	5. Iron railing (height and types specified)	Quintal	per quintal
	6. Iron grills	sqm	per sqm
VIII	**Roofing**		
	1. R.C.C. and R.B.Slab roof (excluding steel)	cum	per cum
	2. L.C. roof over and inclusive of tiles or brick or stone slab etc (thickness specified)	sqm	per sqm
	3. Centering and shuttering form work	sqm	per sqm
	4. A.C.Sheet roofing	sqm	per sqm

IX	**Plastering, points&finishing**		
	1. Plastering-Cement or Lime Mortar (thickness and pro- portion specified)	sqm	per sqm
	2. Pointing	sqm	per sqm
	3. White washing, colour washing, cement wash (number of coats specified)	sqm	per sqm
	4. Distempering (number of coats specified)	sqm	per sqm
	5. Painting, varnishing (number of coats specified)	sqm	per sqm
X	**Flooring**		
	1. 25mm cement concrete over 75mm lime concrete floor (including L.C.)	sqm	per sqm
	2. 25mm or 40mm C.C. floor	sqm	per sqm
	3. Doors and window sills (C.C. or cement mortar plain)	sqm	per sqm
XI	**Rain water pipe /Plain pipe**	1RM	per RM
XII	**Steel wooden trusses**	1No	per 1No
XIII	**Glass pannels(supply)**	sqm	per sqm
XIV	**Fixing of glass panels or cleaning**	No	per no.

Important Items of Work

1. Earthwork:
   - It is measured in m^3 but payment is done in per 100 m^3
   - In foundation we use lean concrete or weak concrete
   - General thickness of concrete in foundation vary from 20 to 45cm.
2. Soiling:
   - When the soil is soft/bad, then one layer of dry brick stone is applied below the concrete paste. This process is called Soiling.
3. DPC:
   - Damp proof course
   - Its thickness varies from 2-2.5cm with thick rich cement mortar M20/(1:1.5:3)

Important Items of Work

4. Pointing and Plastering:

- General thickness of plastering is 12mm
- Plastering and pointing are done in m^2.
- Following are deduction conditions for opening
  a) No deductions is made for small area up to 0.5 m^2
  b) 0.5-3m^2 for opening area, then one side deduction
  c) For opening area greater than 3m^2, then deduction is made both sides

Rules for Measurement

- The rules for measurement of each item are invariably described in IS-1200
- Some important rules are as follows:
    1. Measurement shall be made for finished item of work and description of each item shall include materials, transport, labour, fabrication tools and plant and all types of overheads for finishing the work in required shape, size and specification
    2. In booking, the order shall be in sequence of length, breadth and height or thickness.

Rules for Measurement

3. All works shall be measured subject to the following tolerances
   - Linear measurement shall be measured to the nearest 0.01m.
   - Areas shall be measured to the nearest 0.01 sq.m
   - Cubic contents shall be worked-out to the nearest 0.01 cum

ADMINISTRATIVE APPROVAL

- For any project required by the department an approval so sanction of the competent authority with respect to the cost and work is necessary at the first instance on ***an approximate estimate***.
- Thus administrative approval denotes the formal acceptance by the administrative department concerned of the proposals for incurring expenditure.

TECHNICAL SANCTION

- It means the sanction and order by the competent authority of the department for the ***detailed estimate*** design calculations quantities of work rates and cost of work
- After the technical sanction of the estimate is received the work is then taken up for construction
- After this, financial department sanctions the Expenditure

TYPES OF ESTIMATES

1. APPROXIMATE ESTIMATE

- Preliminary or approximate 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 estimate is accompanied by a report duly explaining necessity and utility of the project and with a site or layout plan
- Following are the methods of approximate estimate:
  - ***a) Plinth area method***
  - ***b) Cubical contents methods***
  - ***c) Unit base method.***

TYPES OF ESTIMATES

1. APPROXIMATE ESTIMATE

a) Plinth area method

- The cost of construction is determined by multiplying plinth area with plinth area rate.
- As per IS 3861-1966 , following areas are used
  a) Area of walls at floor level
  b) Internal shafts of sanitary installations not exceeding 2.0m2 , lifts, airconditionsing ducts etc.,
  c) Area of barsati at terrace level: Barsati means any covered space open on one side constructed on one side constructed on terraced roof which is used as shelter during rainy season.
  d) Porches of non cantilever type
- *Following areas are not included*
  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.

TYPES OF ESTIMATES

1. APPROXIMATE ESTIMATE

b) Cubical contents methods

- 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

c) Unit base method.

- Cost of structure is determined 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 is 'one bed'.
- The unit rate is calculated by dividing the actual expenditure incurred or cost of similar building in the nearby locality by the number of units

Que 3. Prepare an approximate estimate of building project with total plinth area of all building is 1000 sqm. and from following data.

i) Plinth area rate Rs. 5000 per sqm

ii) Cost of water supply @8% of cost of building.

iii) Cost of Sanitary and Electrical installations each @ 7½% of cost of building.

iv) Cost of architectural features @1% of building cost.

v) Cost of contingencies @3% of building cost.

Determine the total cost of building project.

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ii) Cost of water supply @8% of cost of building.

iii) Cost of Sanitary and Electrical installations each @ 7½% of cost of building.

iv) Cost of architectural features @1% of building cost.

v) Cost of contingencies @3% of building cost.

Determine the total cost of building project.

Data given:

Plinth area = 1000m2 .

Plinth area rate = Rs. 5000 per Sqm.

∴ Cost of building = 1000 x 5000 = Rs. 50,00,000

Cost of the water supply charges @8%

$$= \frac{8}{100} \times 5000000 = \boldsymbol{Rs\ 4,00,000}$$

Cost of Sanitary and electrical installation @ 15%

$$= \frac{15}{100} \times 5000000 = \boldsymbol{Rs\ 7,50,000}$$

Cost of architectural features @1%

$$= \frac{1}{100} \times 5000000 = \boldsymbol{Rs\ 50,000}$$

Cost of contingencies @3%

$$= \frac{3}{100} \times 5000000 = \boldsymbol{Rs\ 1,50,000}$$

$$\boldsymbol{Total = Rs\ 63,50,000}$$

Que 3. Prepare an approximate estimate of building project with total plinth area of all building is 1000 sqm. and from following data.

i) Plinth area rate Rs. 5000 per sqm

ii) Cost of water supply @8% of cost of building.

iii) Cost of Sanitary and Electrical installations each @ 7½% of cost of building.

iv) Cost of architectural features @1% of building cost.

v) Cost of contingencies @3% of building cost.

Determine the total cost of building project.

$$Total = Rs\ 63,50,000$$

$$Add\ 8\%\ supervision\ charges$$

$$Total = Rs\ 63,50,000 + 63,50,000 \times \frac{8}{100}$$

$$Total = Rs\ 68,58,000$$

TYPES OF ESTIMATES

2. DETAILED ESTIMATE

- **It consists of working out quantities of various items of work and then determine the cost of each item. This is prepared in two stages**
  - a) **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 numbers column to Depth column as shown**

S.No	Description of Item	No	Length (L) m	Breadth (B) m	Depth/ Height (D/H)m	Quantity	Notes

TYPES OF ESTIMATES

2. DETAILED ESTIMATE

b) Abstract of Estimated Cost :

- The cost of each item of work is worked out from the quantities that already computed in the details measurement form at workable rate.
- But the total **cost** is worked out in the prescribed form is known as **abstract of estimated form.**

Item No.	Description/ Particulars	Quantity	Unit	Rate	Per (Unit)	Amount

TYPES OF ESTIMATES

2. DETAILED ESTIMATE

a) Revised estimate

- When the ***sanctioned estimate exceeds by 5%*** either due to the rate being found insufficient or due to some other reasons, a fresh estimate is prepared which is called a Revised Estimate.
- A comparative statement on the last page of the estimate is attached giving there in the reasons of the increase of cost in case of each item

b) Supplementary Estimate

- This is fresh detailed estimate in addition to the original sanctioned estimate prepared when additional works are deemed necessary during the progress of a work to supplement the original works.
- The abstract of cost should show the amount of the original sanctioned estimate as well as the supplementary amount of the original sanctioned estimate as well as the supplementary amount for which sanction is required

TYPES OF ESTIMATES

2. DETAILED ESTIMATE

c) Annual repair estimate

- In order to keep building and roads in perfect condition, annual repairs should be carried out as follow:-
  - (i) In case of a building-white washing, oiling and painting of doors and windows, cement plaster repairs (inside & outside), repairs of floors etc. ***In no case this annual repair amount should increase more that 1/2% to 2% of the capital cost of the building.***
  - (ii) In case of a road-filling patches, etc.

Que 4. What is the total cost of constructing a school to accommodate 1200 students, if the average cost of 1 seat is Rs 25000?

Average cost of 1 seat = Rs.25000

For 1200 students = 1200×5000 = Rs 3,00,00,000

Que 5. The damp proof course is measured in :

a) Length

b) Area

c) Volume

d) Weight

Que 5. The damp proof course is measured in :

a) Length

b) Area

c) Volume

d) Weight

Que 6. The floor area included the area of the balcony upto :

a) 25 %
b) 85%
c) 75%
d) 50%

Que 6. The floor area included the area of the balcony upto :

a) 25 %

b) 85%

c) 75%

d) 50%

Que 7. The quantity of wood for the shutters of doors and windows in calculated in:

a) m^3

b) Lump-sum

c) m

d) m^2

Que 7. The quantity of wood for the shutters of doors and windows in calculated in:

a) m^3

b) Lump-sum

c) m

d) m^2

Que 8. The plan of a building is in the form of square with centerline dimensions of outer walls as 14.7 m × 14.7 m. If the thickness of the wall in superstructure is 0.30 m, then its plinth area is:

a) 234 m^2

b) 150 m^2

c) 216 m^2

d) 225 m^2

Que 8. The plan of a building is in the form of square with centerline dimensions of outer walls as 14.7 m × 14.7 m. If the thickness of the wall in superstructure is 0.30 m, then its plinth area is:

a) 234 m^2

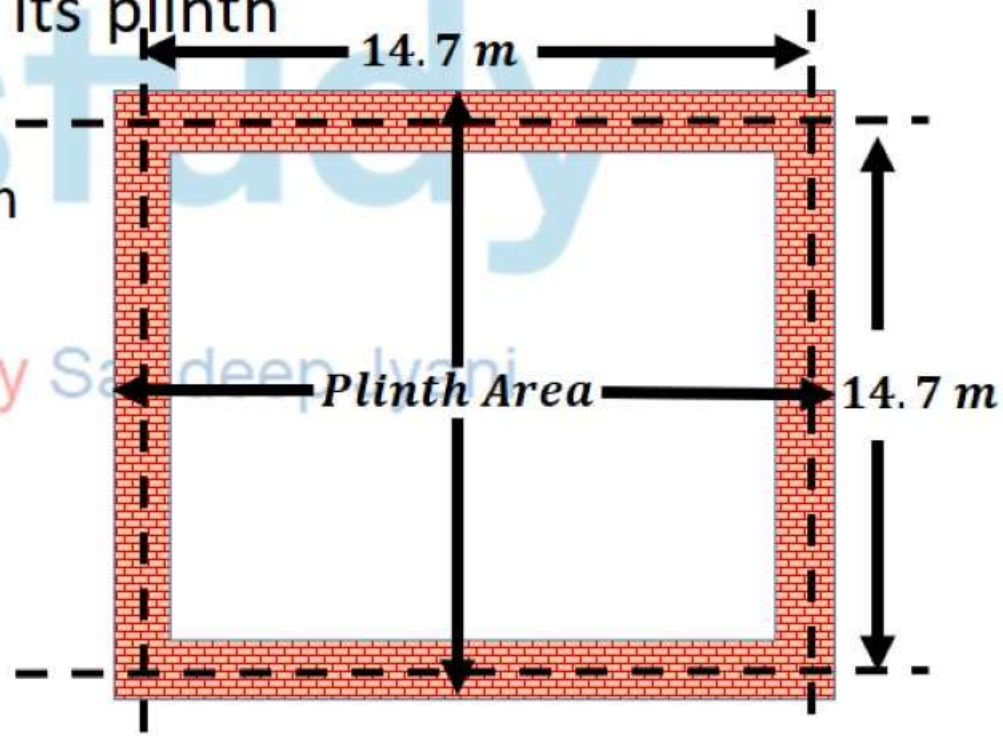
b) 150 m^2

c) 216 m^2

d) 225 m^2

Dimension=14.7+0.30=15m

$$\boldsymbol{Plinth\ Area = 15 \times 15}$$



Que 9. The plan of a building is in the form of a rectangle with centre line dimensions of the outer walls as 10.3 m × 15.3 m. The thickness of the walls in superstructure is 0.3 m. then its carpet area is:

a) 150 m^2

b) 157.59 m^2

c) 165.36 m^2

d) 170 m^2

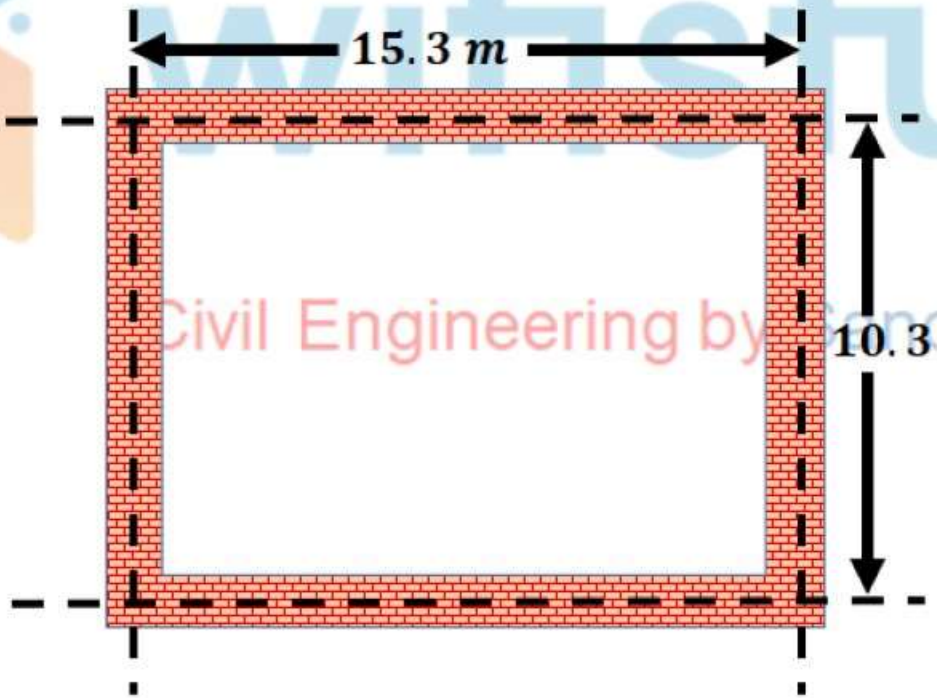
Que 9. The plan of a building is in the form of a rectangle with centre line dimensions of the outer walls as 10.3 m × 15.3 m. The thickness of the walls in superstructure is 0.3 m. then its carpet area is:

a) 150 m²

b) 157.59 m²

c) 165.36 m²

d) 170 m²



$$L = 10.3 - 0.30 = 10m$$

$$B = 15.3 - 0.30 = 15m$$

$$Carpet\ Area = 15 \times 10$$

Que 10. Pick up the item of work not included in the plinth area estimate:

a) Wall thickness

b) Room area

c) Veranda area

d) Courtyard area

Que 10. Pick up the item of work not included in the plinth area estimate:

a) Wall thickness

b) Room area

c) Veranda area

d) Courtyard area

Que 11. One brick thickness of wall is roughly equal to

a) 10 cm
b) 15 cm
c) 20 cm
d) 30 cm

Que 11. One brick thickness of wall is roughly equal to

a) 10 cm

b) 15 cm

c) 20 cm

d) 30 cm

Que 12. Estimate for electrical wiring is prepared on the basis of

a) Voltage

b) Power

c) Number of appliances

d) Number of points

Que 12. Estimate for electrical wiring is prepared on the basis of

a) Voltage

b) Power

c) Number of appliances

d) Number of points

Que 13. An estimate is

a) Cost of the structure using thumb rules

b) Random guess of cost of structure

c) Probable cost arrived at before construction

d) Actual cost of construction.

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a) Cost of the structure using thumb rules

b) Random guess of cost of structure

c) Probable cost arrived at before construction

d) Actual cost of construction.

Que 14. The information which cannot be included in drawings is conveyed to the estimator through

a) Specifications
b) Cover note
c) Progress chart
d) None of these

Que 14. The information which cannot be included in drawings is conveyed to the estimator through

a) Specifications

b) Cover note

c) Progress chart

d) None of these

Que 15. The weight of 10 mm diameter mild steel rod per metre length is equal to

a) 0.22 kg
b) 0.32 kg
c) 1 kg
d) 0.62 kg

Que 15. The weight of 10 mm diameter mild steel rod per metre length is equal to

a) 0.22 kg

b) 0.32 kg

c) 1 kg

d) 0.62 kg

$$\rho_{steel} = 7850 kg/m^3$$

$$\rho = \frac{M}{V}$$

$$\mathrm{M} = \rho \times V$$

$$\mathrm{M} = 7850 \times \frac{\pi}{4} d^2 h$$

$$\mathrm{M} = 7850 \times \frac{\pi}{4} (0.01)^2 (1) = 0.62\mathrm{kg}$$

Que 16. Of the total estimated cost of a building, the cost of electrification usually accounts for

a) 1 %
b) 5%
c) 8%
d) 20 %

Que 16. Of the total estimated cost of a building, the cost of electrification usually accounts for

a) 1 %

b) 5%

c) 8%

d) 20 %

Que 17. The number of bricks required per cubic metre of brick masonary is

a) 480
b) 500
c) 520
d) 540

Que 17. The number of bricks required per cubic metre of brick masonry is

a) 480

b) 500

c) 520

d) 540

Que 18. The explosive for blasting is usually expressed in terms of

a) Explosive power

b) Volume of earthwork that can be blasted

c) Kilograms

d) None of these

Que 18. The explosive for blasting is usually expressed in terms of

a) Explosive power

b) Volume of earthwork that can be blasted

c) Kilograms

d) None of these

Que 19. Working out of exact quantities of various items of Work is known as

a) Estimation
b) Measurement
c) Quantity Surveying
d) Valuation

Que 19. Working out of exact quantities of various items of Work is known as

a) Estimation
b) Measurement
c) Quantity Surveying
d) Valuation

Que 20. The covered area of a proposed building is 150 m^2 and it includes a rear courtyard of 5m × 4m. If the prevailing plinth area rate for similar building is Rs 1250/m^2, what is its cost (in Rs)?

a) 187500

b) 212500

c) 162500

d) 375000

Que 20. The covered area of a proposed building is 150 m^2 and it includes a rear courtyard of 5m × 4m. If the prevailing plinth area rate for similar building is Rs 1250/m^2, what is its cost (in Rs)?

a) 187500

b) 212500

c) 162500

d) 375000

$$plinth\ area = 150 - (5 \times 4) = 130m^2$$

$$cost = plinth\ area \times rate$$
$$= 130 \times 1250$$
$$= Rs.162500$$

Que 21. The unit of measurement in per quintal for:

a) Collapsible gate with rails

b) Rolling shutters

c) Expanded metal wire netting

d) Reinforcement of RCC works

Que 21. The unit of measurement in per quintal for:

a) Collapsible gate with rails

b) Rolling shutters

c) Expanded metal wire netting

d) Reinforcement of RCC works

Que 22. FAR means:

a) $\frac{Total\ flor\ areas\ of\ all\ floor - ground\ Floor\ Area}{Plot\ Area}$

b) $\frac{Total\ floor\ Area\ of\ all\ the\ floors - area\ of\ ground\ floor}{Area\ of\ Plinth}$

c) $\frac{Total\ Floor\ Area\ of\ all\ floors}{Plot\ Area}$

d) $\frac{Total\ Floor\ Area\ of\ all\ floors}{Plinth\ Area}$

Que 22. FAR means:

a) $\frac{Total\ flor\ areas\ of\ all\ floor - ground\ Floor\ Area}{Plot\ Area}$

b) $\frac{Total\ floor\ Area\ of\ all\ the\ floors - area\ of\ ground\ floor}{Area\ of\ Plinth}$

c) $\frac{\textbf{Total Floor Area of all floors}}{\textbf{Plot Area}}$

d) $\frac{Total\ Floor\ Area\ of\ all\ floors}{Plinth\ Area}$

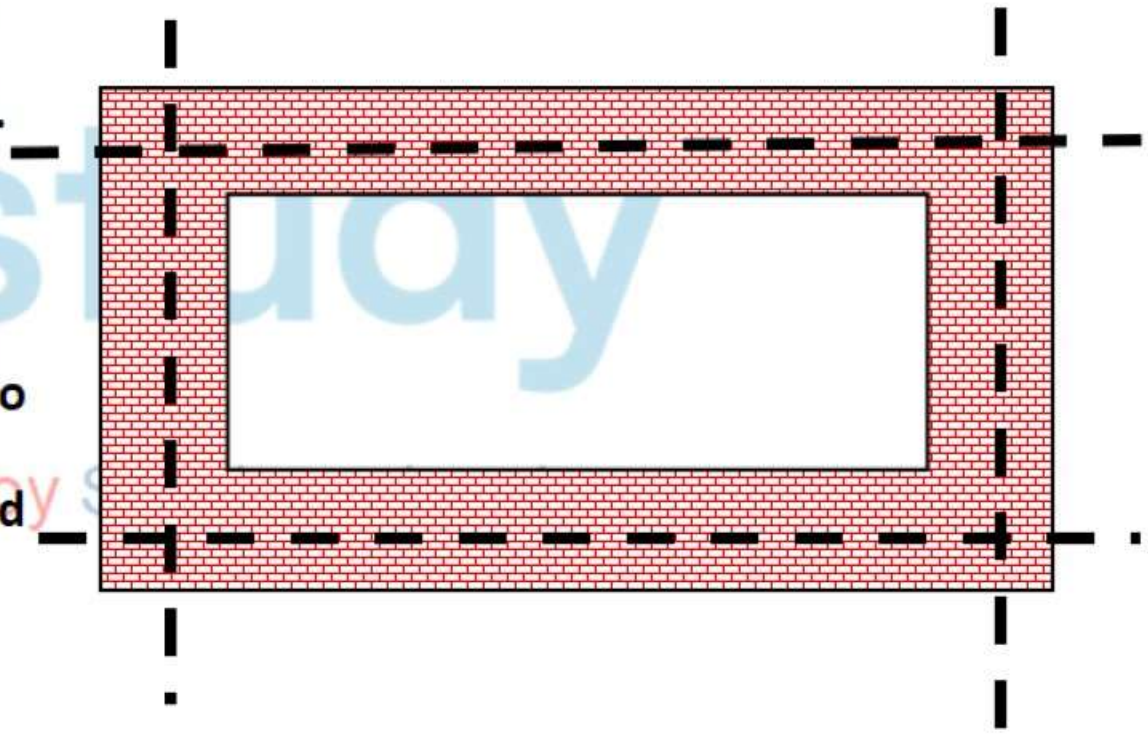
METHODS OF TAKING OUT QUANTITIES

- **The quantities like earth work, foundation concrete, brickwork in plinth and super structure etc., can be workout by any of following methods:**
  - **a)Long wall - short wall method**
  - **b) Centre line method.**
  - **c) Partly centre line and short wall method.**

METHODS OF TAKING OUT QUANTITIES

a) Long wall-short wall method:

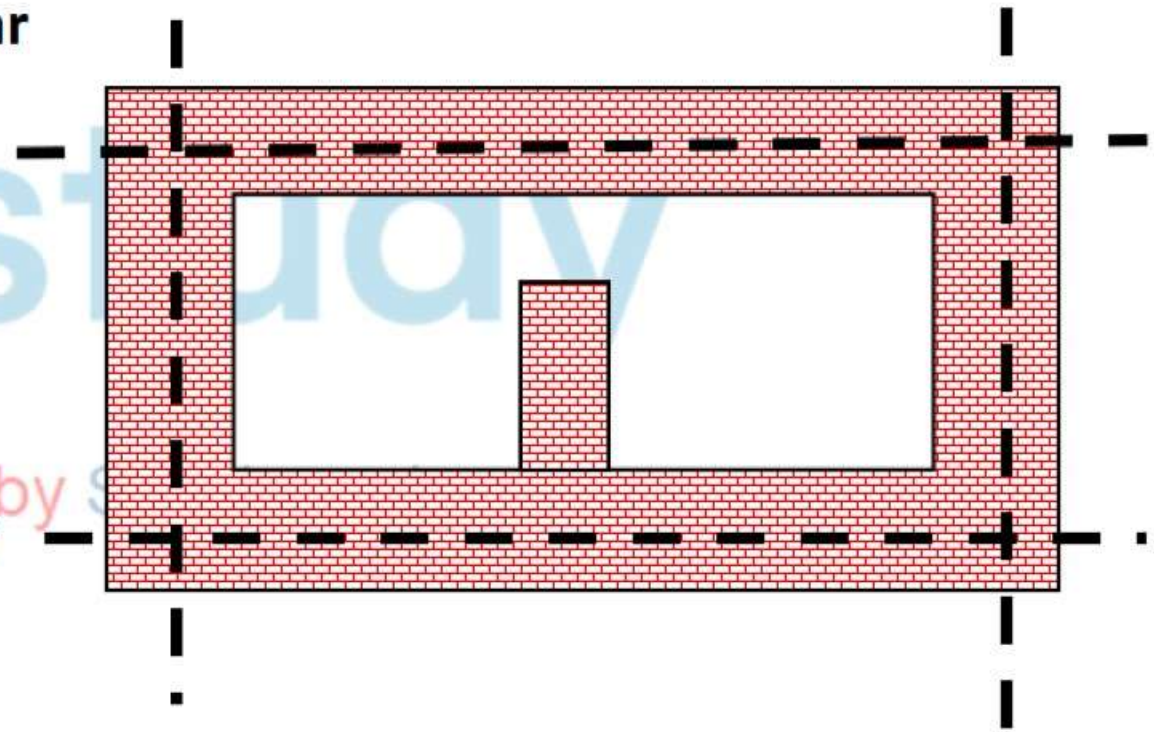
- In this method, the wall along the length of room is considered to be long wall while the wall perpendicular to long wall is said to be short wall.
- To get the length of long wall or short wall, calculate first the centre line lengths of individual walls.
- Then the length of long wall, (out to out) 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



METHODS OF TAKING OUT QUANTITIES

2) Centre Line method:

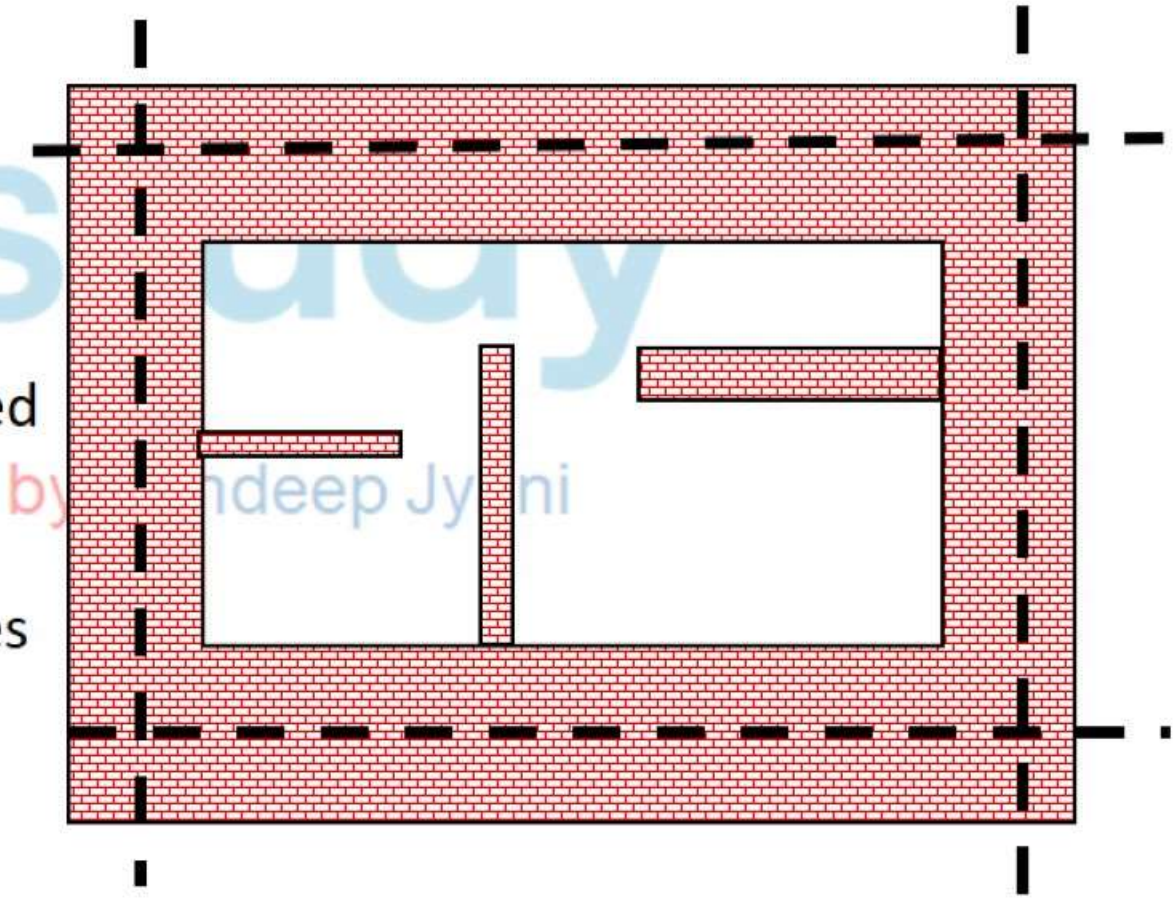
- This method is suitable for walls of similar cross sections.
- Here the total centre line length is multiplied by breadth and depth of respective item to get the total quantity at a time.
- When cross walls or partitions or verandah walls join with main wall, the centre line length gets reduced by half of breadth for each junction.
- Such junction or joints are studied carefully while calculating total centre line length. The estimates prepared by this method are most accurate and quick



METHODS OF TAKING OUT QUANTITIES

3) Partly Centre Line and partly long wall short wall method:

- This method is adopted when external (i.e., around the building) wall is of same thickness and the internal walls having different thicknesses.
- In such cases,centre line method is applied to external walls and long wall-short wall method is used to internal walls.
- This method suits for different thicknesses walls and differen tlevel of foundations.
- Because of this reason, all Engineering departments are practicing this method.



Que 23. The most reliable estimate is :

a) Plinth area estimate

b) Detailed estimate

c) Preliminary estimate

d) Cube rate estimate

Que 23. The most reliable estimate is :

a) Plinth area estimate

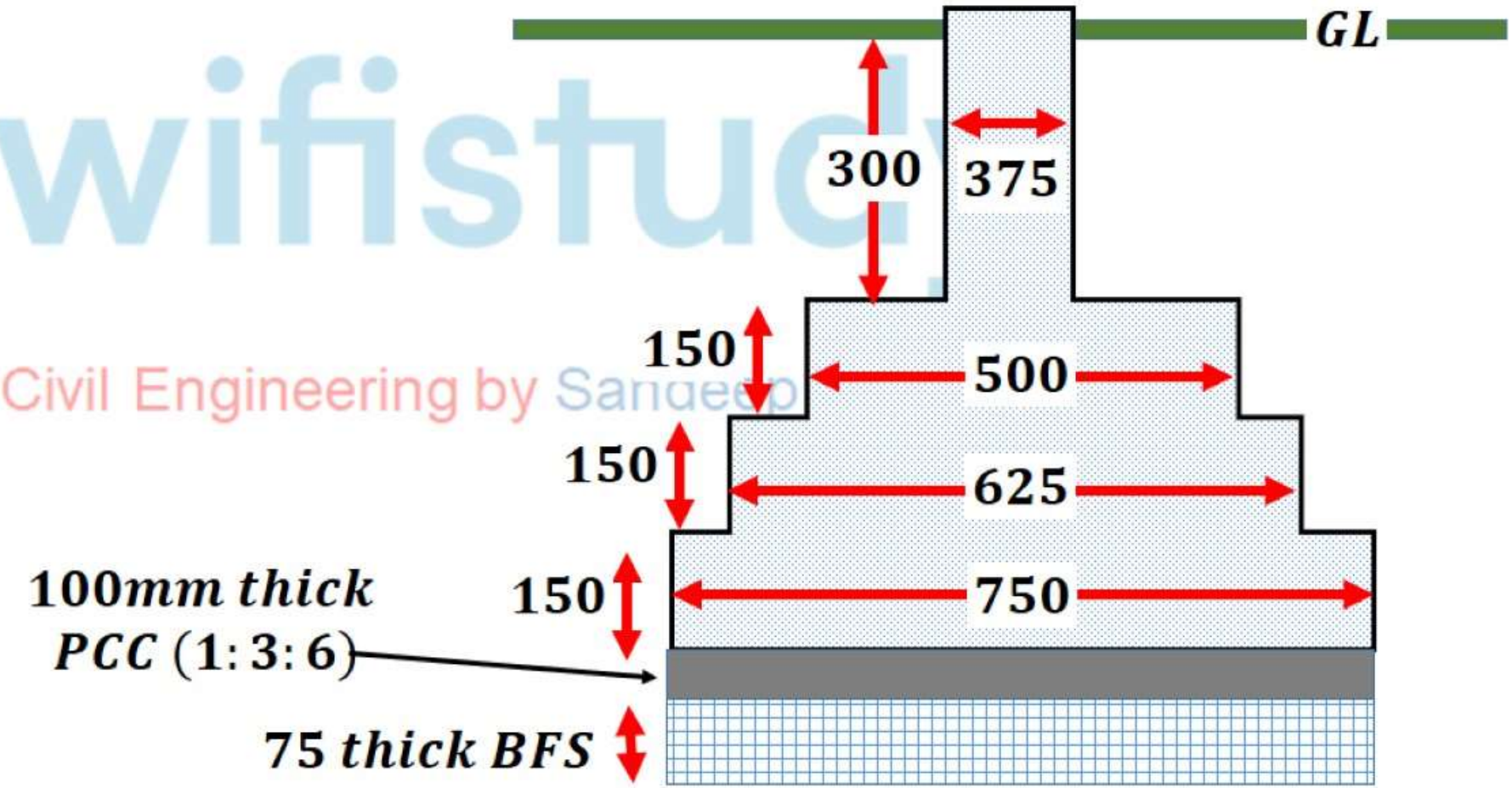
b) Detailed estimate

c) Preliminary estimate

d) Cube rate estimate

Que 24. The cross-section of a strip footing is shown below. The quantity of BFS under the footing per meter length is

a) 0.750 Cu. m
b) 0.750 Sq. m
c) 0.056 Cu. m
d) 0.056 Sq. m



Que 24. The cross-section of a strip footing is shown below. The quantity of BFS under the footing per meter length is

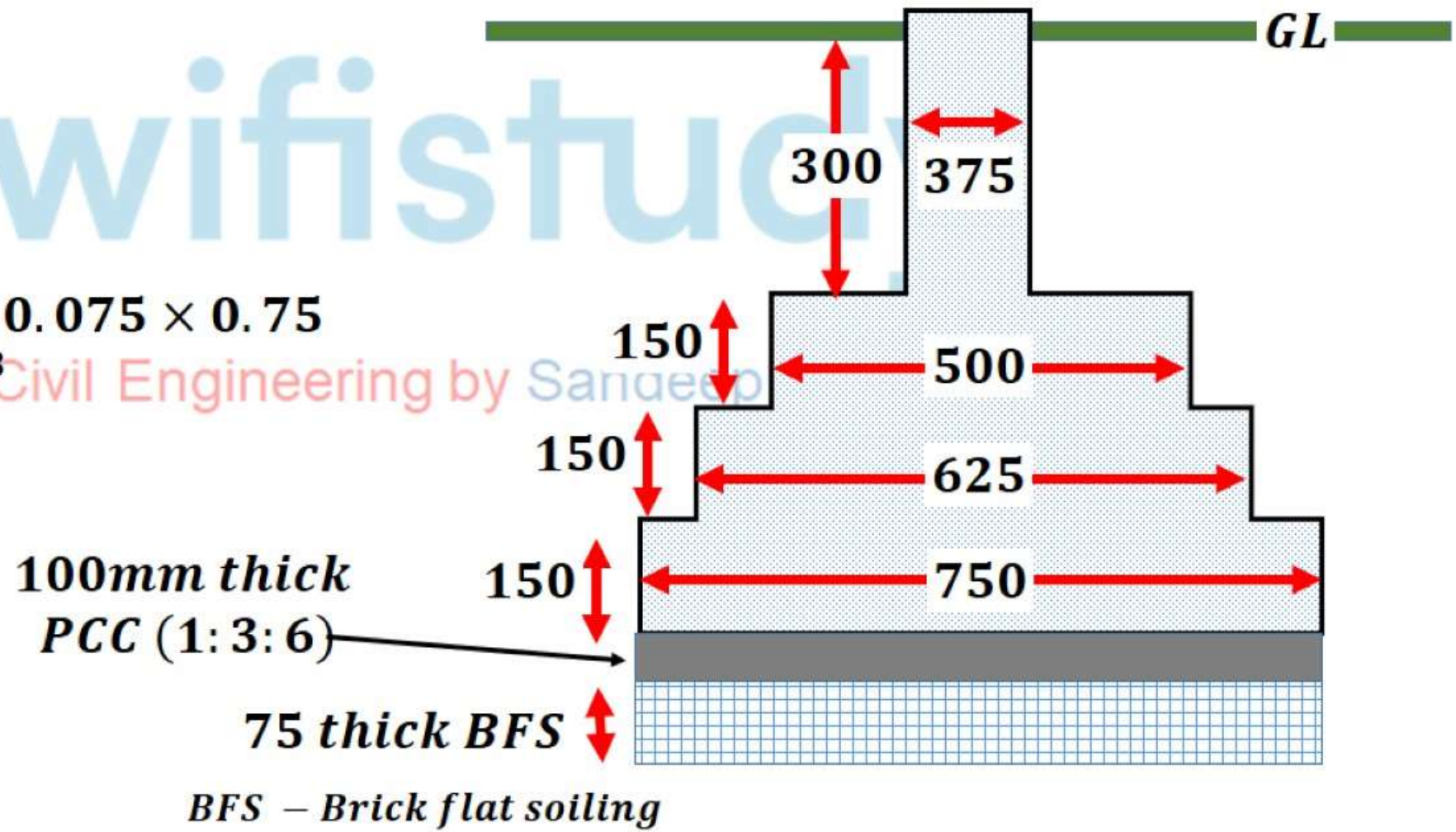
a) 0.750 Cu. m

b) 0.750 Sq. m

c) 0.056 Cu. m

d) 0.056 Sq. m

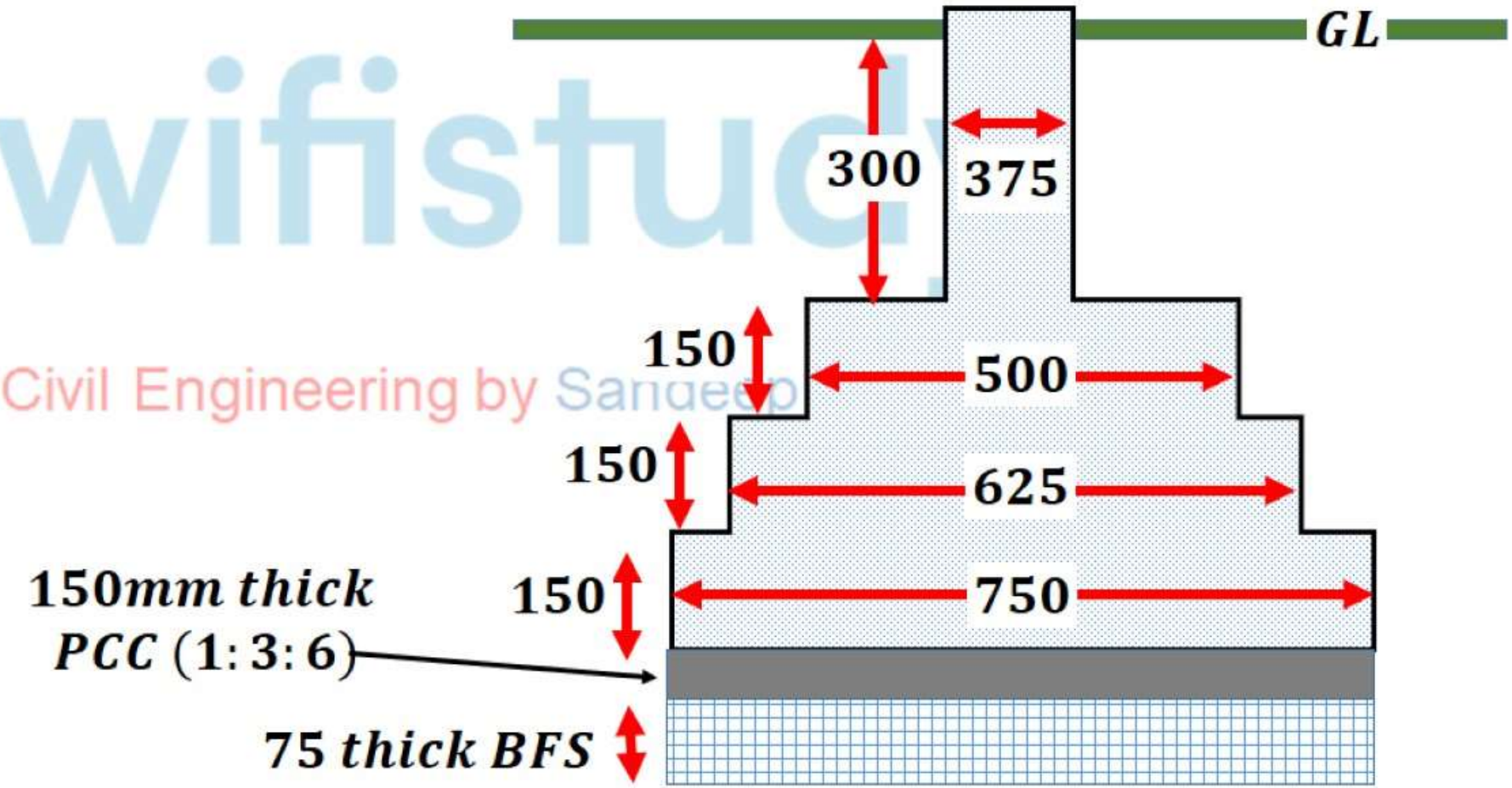
$$Quantity\ of\ BFS = 1 \times 0.075 \times 0.75$$
$$= 0.056 m^3$$



BFS – Brick flat soiling

Que 25. The cross-section of a strip footing is shown below. The quantity of 150 thick PCC (1 : 3 : 6) per meter length of footing is :

a) 0.094 Sq. m
b) 0.112 Cu. m
c) 0.625 Sq. m
d) 0.625 Cu. m



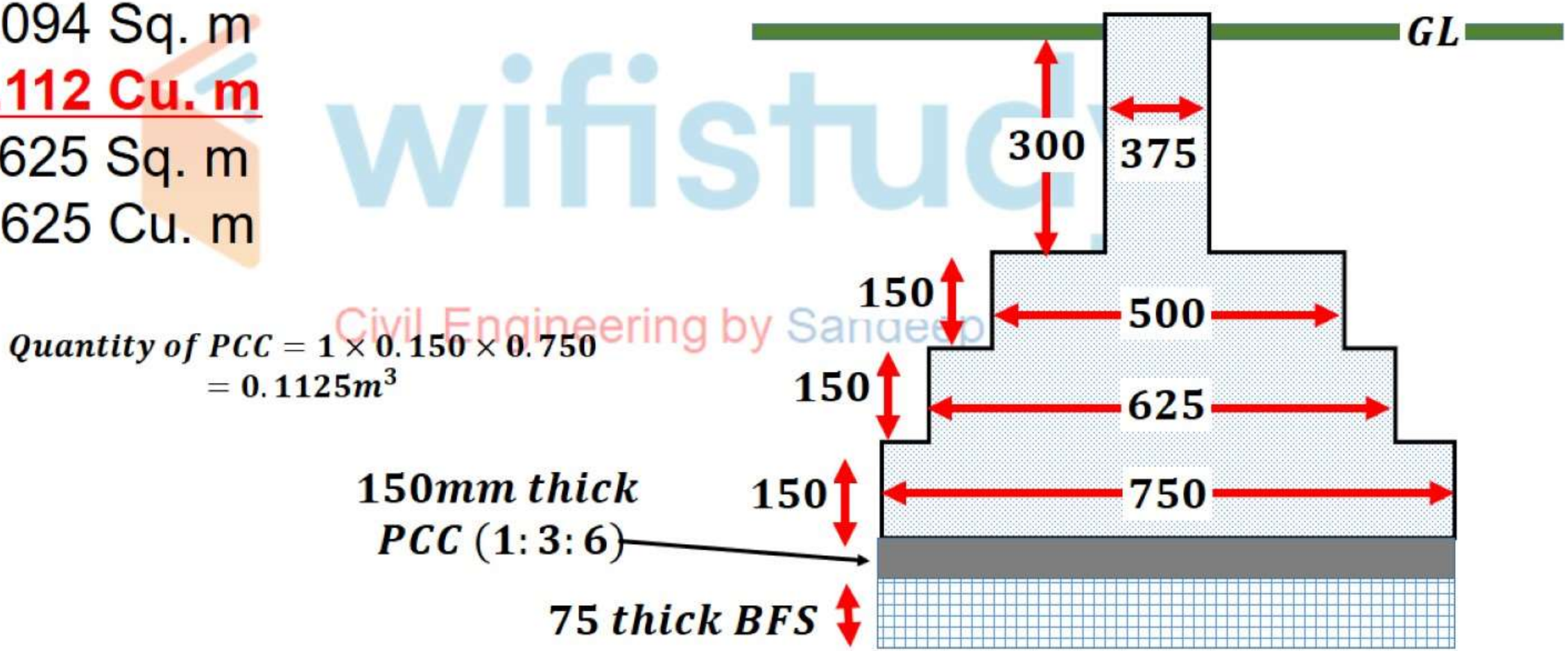
Que 25. The cross-section of a strip footing is shown below. The quantity of 150 thick PCC (1 : 3 : 6) per meter length of footing is :

a) 0.094 Sq. m

b) 0.112 Cu. m

c) 0.625 Sq. m

d) 0.625 Cu. m



$$Quantity\ of\ PCC = 1 \times 0.150 \times 0.750$$
$$= 0.1125 m^3$$

Que 26. For one Sq. m single brick flat soling (conventional size 22.4 x 11.4 x 7 cm), the number of brick required is:

a) 54

b) 39

c) 32

d) 44

Que 26. For one Sq. m single brick flat soling (conventional size 22.4 x 11.4 x 7 cm), the number of brick required is:

a) 54

b) 39

c) 32

d) 44

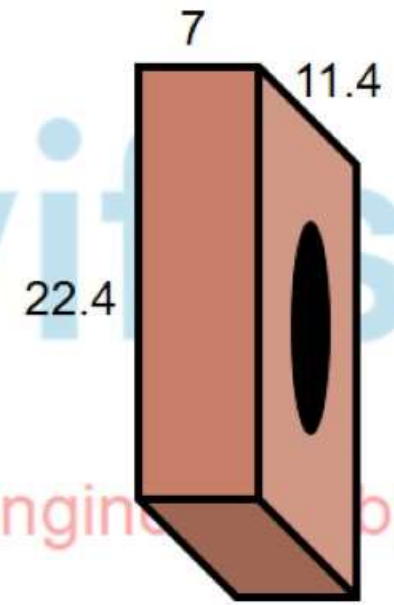
Size of Brick in masonary = 250 x 125 x 75 mm

Size of single brick flat = 0.25 x 0.125 $= 0.03125m^2$

Number of brick for 1 sq.m = $\frac{1}{0.03125} = 32$

Que 27. The number of bricks (conventional size) required for one square meter of brick on edge soling is :

a) 54
b) 64
c) 34
d) 44



Que 27. The number of bricks (conventional size) required for one square meter of brick on edge soling is :

a) 54

b) 64

c) 34

d) 44

Size of Brick in masonary = 250 x 125 x 75 mm

Size of brick on edge soiling = 0.25 x 0.075 $= 0.01875m^2$

Number of brick for 1 sq.m = $\frac{1}{0.01875} = 54$

Que 28. For 1 sqm of 7.5 cm thick lime terracing in roof with brick khoa, surkhi, lime (2 : 2 : 7) including finishing, the quantity of surkhi required is:

a) 0.023 Cu. m
b) 0.025 Cu. m
c) 0.019 Cu. m
d) 0.022 Cu. M

Que 28. For 1 sqm of 7.5 cm thick lime terracing in roof with brick khoa, surkhi, lime (2 : 2 : 7) including finishing, the quantity of surkhi required is:

a) 0.023 Cu. m

b) 0.025 Cu. m

c) 0.019 Cu. m

d) 0.022 Cu. M

$$Volume\ of\ lime\ terracing = 1 \times 0.075 = 0.075m^3$$

$$Ratio\ of\ brick\ khoa, surkhi\ and\ lime = 2:2:7$$

$$Wet\ volume\ of\ surkhi = \frac{2}{11} \times 0.075 = 0.0136m^3$$

$$Dry\ volume\ is\ \frac{1}{3}rd\ extra\ of\ wet\ volume$$

$$Volume\ of\ surkhi\ required = \frac{4}{3} \times 0.0136 = 0.01813m^3$$

Que 29. For 15 mm thick cement plastering 1:6 on 100 Sq.m. new brick work, the quantity of cement required is:

a) 0.200 m^3

b) 0.247 m^3

c) 0.274 m^3

d) 0.343 m^3

Que 29. For 15 mm thick cement plastering 1:6 on 100 Sq.m. new brick work, the quantity of cement required is:

a) 0.200 m^3

b) 0.247 m^3

c) 0.274 m^3

d) 0.343 m^3

$$Dry\ volume\ of\ mortar = 0.015 \times 100 = 1.5m^3$$

$$Assuming\ that\ materials\ consists\ of\ 60\%voids$$
$$hence\ for\ 1m^3\ of\ wet\ cement\ mortar$$
$$1.6m^3 of\ materials\ are\ required$$
$$= 1.5 \times 1.6 = 2.4m^3$$

$$Ratio\ of\ cement\ and\ sand = 1:6$$

$$Volume\ of\ cement\ required = \frac{1}{7} \times 2.4 = 0.343m^3$$

Que 30. the woodwork should be measured to nearest:

a) 0.001 m

b) 0002 m

c) 0.003 m

d) 0.004 m

Que 30. the woodwork should be measured to nearest:

a) 0.001 m

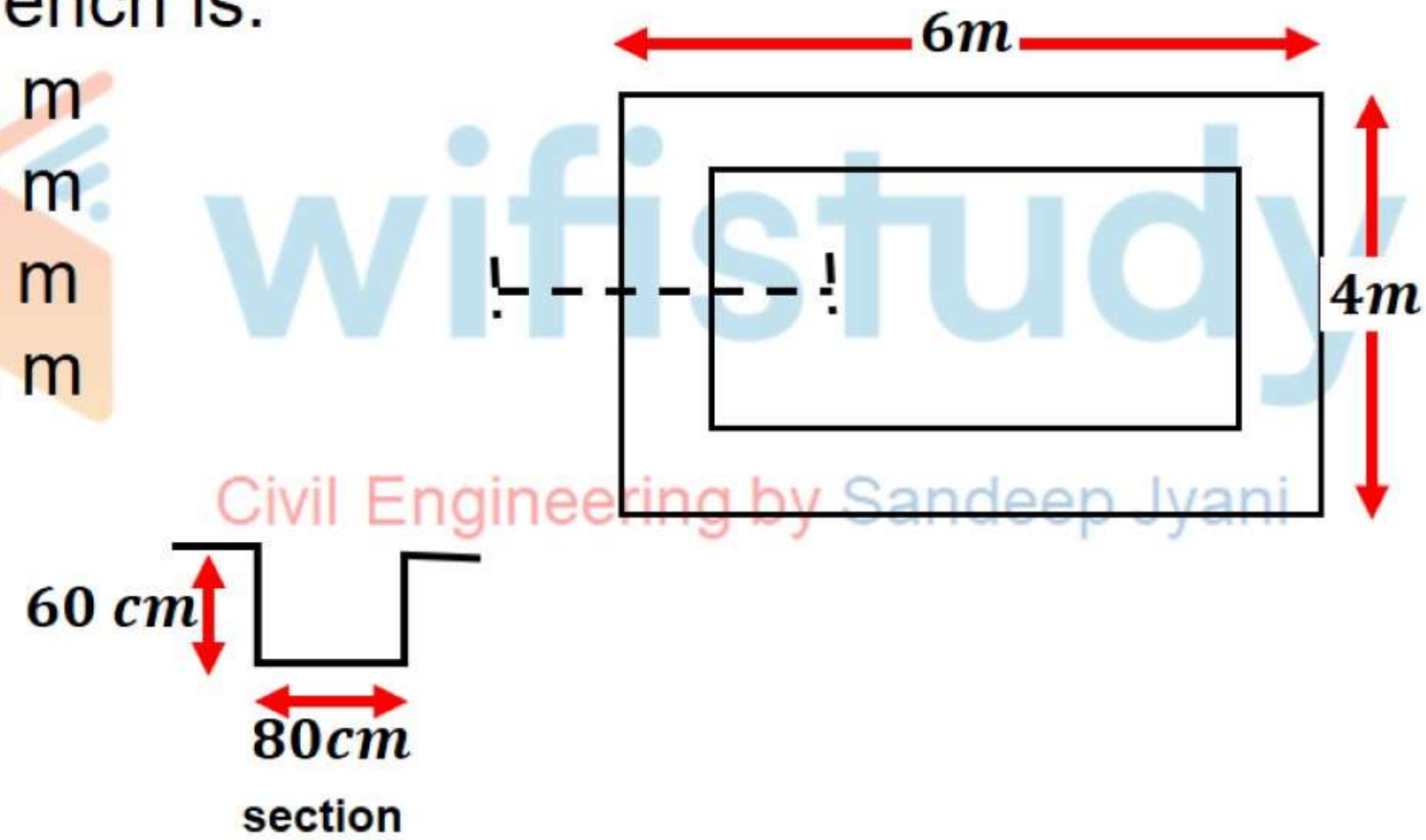
b) 0.002 m

c) 0.003 m

d) 0.004 m

Que 31. The above figure represents plan and section of an excavation layout. The volume of earthwork in excavation of foundation trench is:

a) 6.528 Cu. m
b) 8.064 Cu. m
c) 8.832 Cu. m
d) 9.600 Cu. m



Que 31. The above figure represents plan and section of an excavation layout. The volume of earthwork in excavation of foundation trench is:

a) 6.528 Cu. m

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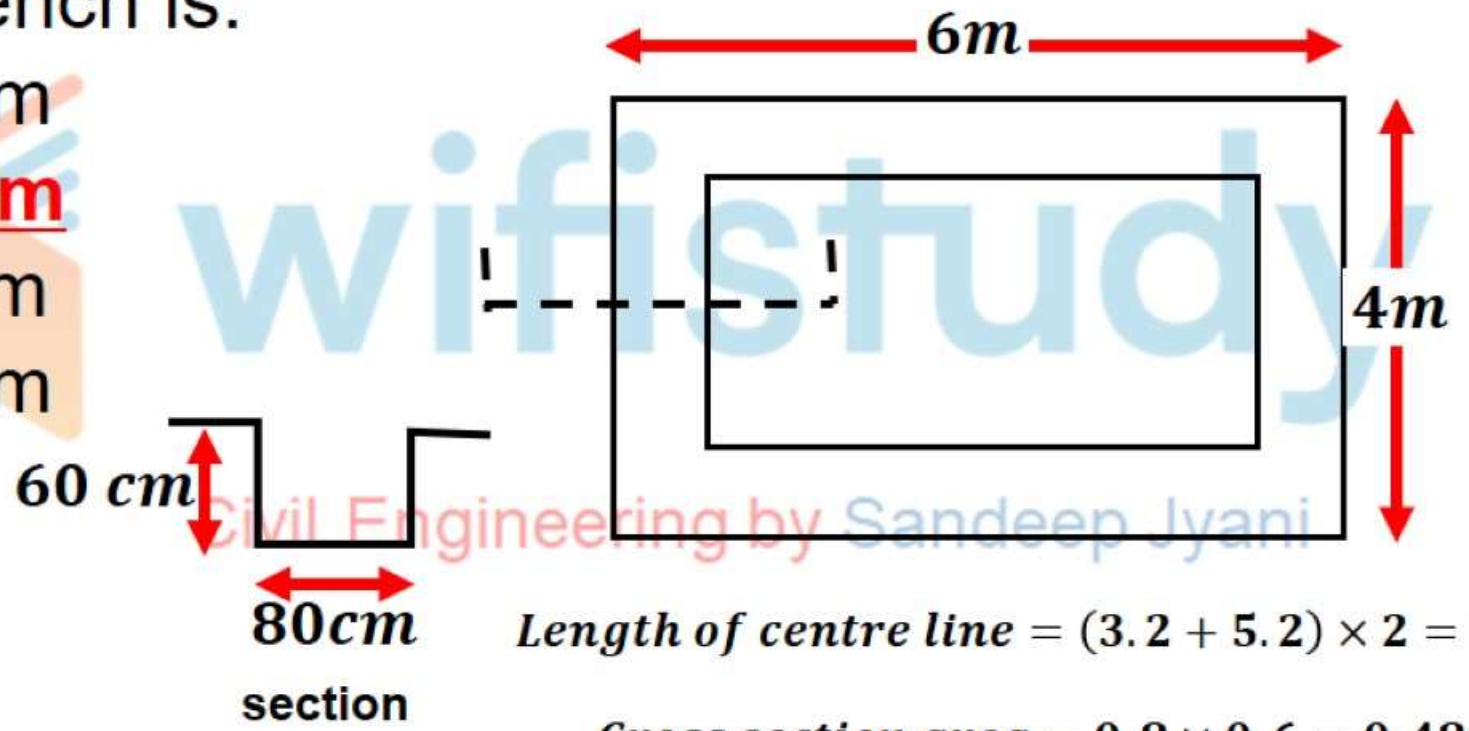


$$Length\ of\ centre\ line = (3.2 + 5.2) \times 2 = 16.8m$$

$$Cross\ section\ area = 0.8 \times 0.6 = 0.48m^2$$

$$Volume\ of\ excavation = 0.8 \times 0.6 \times 16.8 = 8.064m^3$$

Que 32. If ‘d’ be the diameter of MS of tor steel bars in mm, the standard weight (in kg) per meter of the bar is :

a) $0.00618\ d^2$

b) $0.00618\ d$

c) $0.00816\ d^2$

d) $0.00016\ d$

Que 32. If ‘d’ be the diameter of MS of tor steel bars in mm, the standard weight (in kg) per meter of the bar is :

a) 0.00618 d^2

b) 0.00618 d

c) 0.00816 d^2

d) 0.00016 d

$$standard\ weight\ (in\ kg) per\ meter = \rho \times Volume$$

$$standard\ weight\ (in\ kg) per\ meter = 7850 \times \frac{\pi}{4} d^2 \times 10^{-6} \times 1$$

$$standard\ weight\ (in\ kg) per\ meter = 0.00618 d^2$$

Que 33. the following document contains detailed description of all items of work excluding their quantities along with the current rates :

a) Analysis of rates

b) Tender document

c) Abstract estimate

d) Schedule of rate

Que 33. the following document contains detailed description of all items of work excluding their quantities along with the current rates :

a) Analysis of rates

b) Tender document

c) Abstract estimate

d) Schedule of rate

Que 34. Administrative head of public work department who is directly responsible to government is:

a) Assistant Engineer
b) Executive engineer
c) Superintending Engineer
d) Chief engineer

Que 34. Administrative head of public work department who is directly responsible to government is:

a) Assistant Engineer

b) Executive engineer

c) Superintending Engineer

d) Chief engineer

Que 35. thickness of plastering is usually :

a) 40 mm

b) 6 mm

c) 12 mm

d) 25 mm

Que 35. thickness of plastering is usually :

a) 40 mm

b) 6 mm

c) 12 mm

d) 25 mm

Que 36. A work costing Rs. 20,000 is termed as

a) Petty work

b) Minor work

c) Major work

d) Minor project

Que 36. A work costing Rs. 20,000 is termed as

a) Petty work <= Rs 20,000

b) Minor work Rs 20,000 – 1,00,000

c) Major work >Rs 1,00,000

d) Minor project

Que 37. Most accurate method of estimation is based on:

a) Building cost index estimate

b) Point area estimate

c) Detailed estimate

d) Cube rate estimate

Que 37. Most accurate method of estimation is based on:

a) Building cost index estimate

b) Point area estimate

c) Detailed estimate

d) Cube rate estimate

Que 38. For building project estimate which method is generally used in PWD?

a) Long wall and short wall method

b) Center line method

c) Crossing method

d) Short wall method

Que 38. For building project estimate which method is generally used in PWD?

a) Long wall and short wall method

b) Center line method

c) Crossing method

d) Short wall method

Que 39. In the analysis of rates, the profit for the contractor is generally taken as

a) 20%

b) 15%

c) 10%

d) 5%

Que 39. In the analysis of rates, the profit for the contractor is generally taken as

a) 20%

b) 15%

c) 10%

d) 5%

Que 40. In case of steel rolling shutters, for the estimation of painted area; the plain area is multiplied by

a) 0.75

b) 1.1

c) 1.25

d) 1.50

Que 40. In case of steel rolling shutters, for the estimation of painted area; the plain area is multiplied by

a) 0.75

b) 1.1

c) 1.25

d) 1.50

Que 41. In the centre line method of working out volumes; for cross walls; what deductions must be made from the centre line length at each junction?

a) Twice the breadth

b) Half the breadth

c) 1.5 breadth

d) None of these

Que 41. In the centre line method of working out volumes; for cross walls; what deductions must be made from the centre line length at each junction?

a) Twice the breadth

b) Half the breadth

c) 1.5 breadth

d) None of these

Que 42. The volume of the cement required for 10m³ of brickwork in 1:6 cement mortar is approximately equal to

a) 3/7 m³

b) 3/6 m³

c) 3/4 m³

d) 3/5 m³

Que 42. The volume of the cement required for 10m³ of brickwork in 1:6 cement mortar is approximately equal to

a) 3/7 m³

b) 3/6 m³

c) 3/4 m³

d) 3/5 m³

$$Nominal\ size\ of\ brick\ in\ masonary = 20cm \times 10cm \times 10cm$$

$$Actual\ size\ of\ brick = 19cm \times 9cm \times 9cm$$

$$Volume\ of\ mortar\ per\ nominal\ size\ brick = (20cm \times 10cm \times 10cm) - (19cm \times 9cm \times 9cm) = 461cm^3$$

$$Volume\ of\ wet\ mortar\ reqd\ for\ 10m^3\ brickwork = \frac{461}{20 \times 10 \times 10} \times 10 = 2.305m^3$$

$$Volume\ of\ dry\ mortar = 1.3 \times 2.305 = 3\ m^3$$

$$For\ 1:6\ cement\ mortar, volume\ of\ cement = \frac{3}{7}m^3$$

Que 43. Whenever Colour washing on Asbestos cement corrugated sheets in done; in the estimation the plain area of the sheets is increased by :

a) 5 %
b) 10 %
c) 15 %
d) 20 %

Que 43. Whenever Colour washing on Asbestos cement corrugated sheets in done; in the estimation the plain area of the sheets is increased by :

a) 5 %

b) 10 %

c) 15 %

d) 20 %

Que 44. The technique of finding the fair price of an existing building on property is known as

a) Estimation

b) Valuation

c) Pricing

d) Costing

Que 44. The technique of finding the fair price of an existing building on property is known as

a) Estimation

b) Valuation

c) Pricing

d) Costing

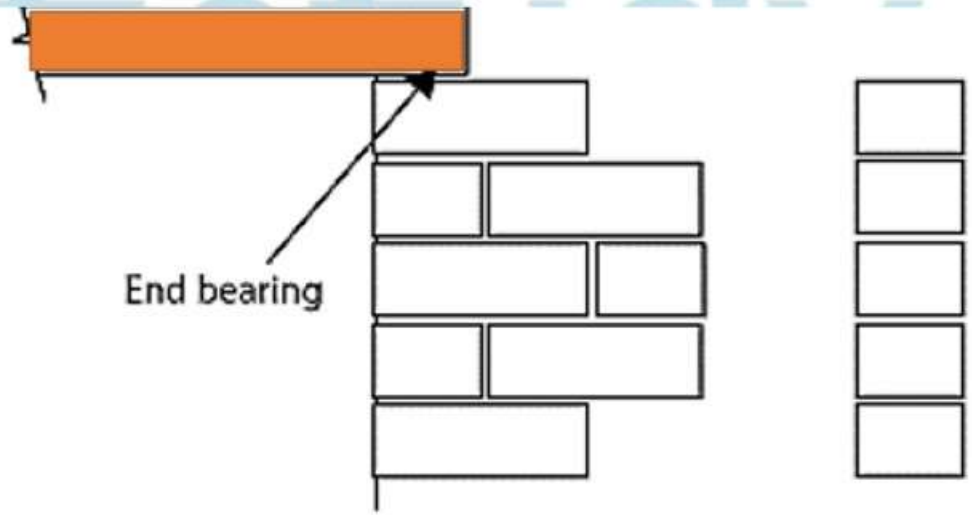
Que 45. If the bearing is not specified for the lintel in the estimation it is usually taken as

a) Thickness of lintel subjected to a minimum value of 12 cm

b) ¾ of lintel thickness of 12 cm whichever is larger

c) ½ of lintel thickness

d) 15



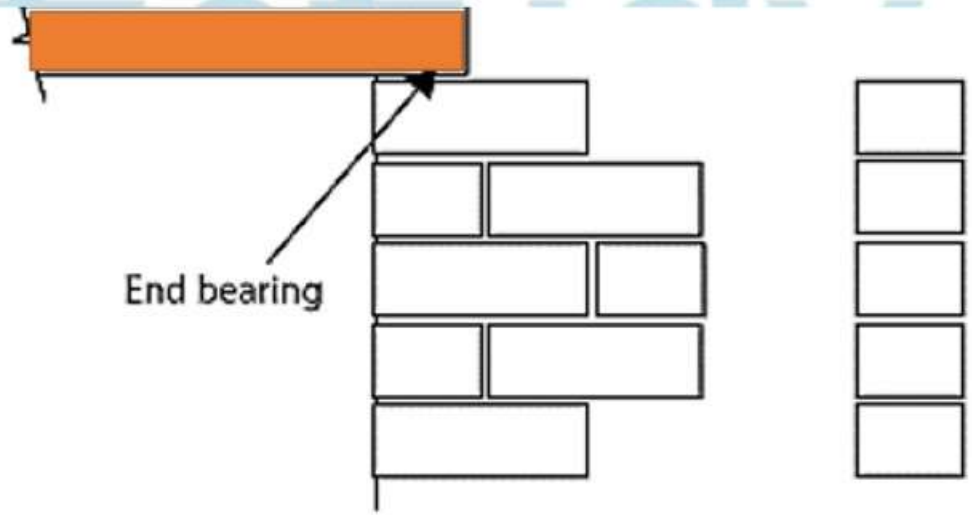
Que 45. If the bearing is not specified for the lintel in the estimation it is usually taken as

a) Thickness of lintel subjected to a minimum value of 12 cm

b) ¾ of lintel thickness of 12 cm whichever is larger

c) ½ of lintel thickness

d) 15



Que 46. The plan of a building is in the form of a rectangle with centre line dimensions of outer wall as 14.7m × 9.7 m. the thickness of the wall in super structure is 0.30 m. what is the floor area of the building?

a) 150 m^2

b) 139 m^2

c) 152 m^2

d) None of these

Que 46. The plan of a building is in the form of a rectangle with centre line dimensions of outer wall as 14.7m × 9.7 m. the thickness of the wall in super structure is 0.30 m. what is the floor area of the building?

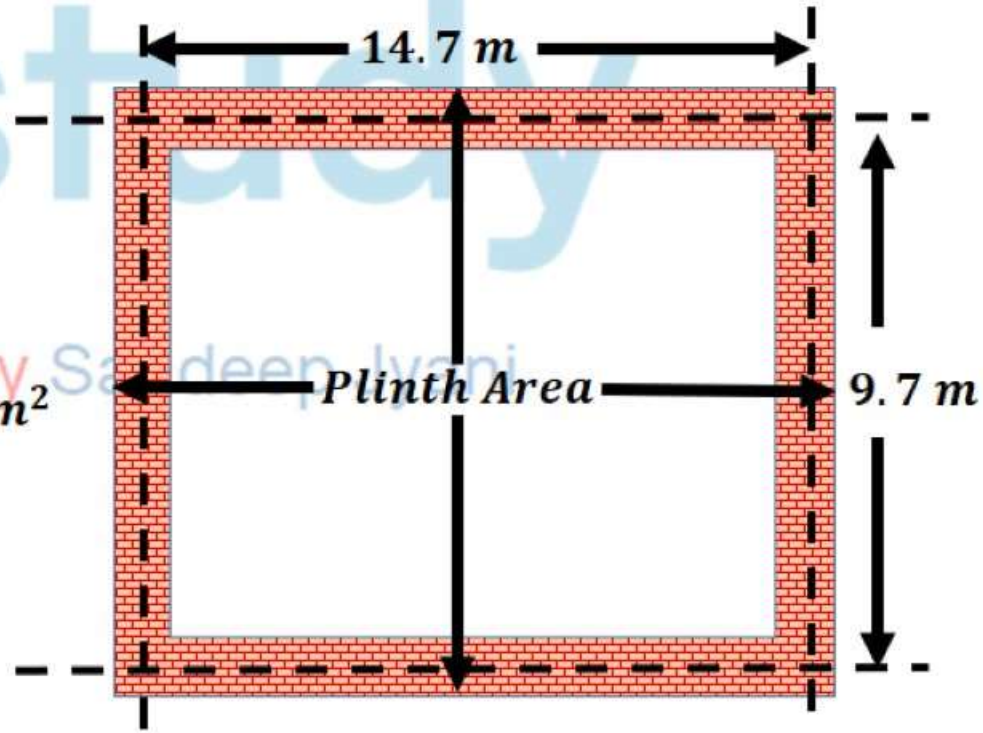
a) 150 m²

b) 139 m²

c) 152 m²

d) None of these

$$Floor\ Area = (14.7 - 0.3)(9.7 - 0.3) = 135.36m^2$$



Que 47. In the estimation of plastering surface the deductions are not made for

a) Ends of beams

b) Ends of rafters

c) Small openings upto 0.50 m^2

d) None of these

Que 47. In the estimation of plastering surface the deductions are not made for

a) Ends of beams

b) Ends of rafters

c) **Small openings upto 0.50 m^2**

d) None of these

For small openings upto 0.5 sq m no deduction is made

For opening 0.5 − 3 sq m deduction is made for one side

For opening above 3m deduction is made on both sides

Que 48. The approximate volume of cement required to prepare 100 m^3 of 1 : 2 : 4 concrete is

a) 16 m^3

b) 32 m^3

c) 25 m^3

d) 21 m^3

Que 48. The approximate volume of cement required to prepare 100 m^3 of 1 : 2 : 4 concrete is

a) 16 m^3

b) 32 m^3

c) 25 m^3

d) 21 m^3

$$volume\ of\ cement\ required\ in\ 100\ m^3\ of\ concrete = \frac{1}{1+2+4} \times 100 = 14.28 m^3$$

$$volume\ of\ wet\ concrete\ required = 1.5 \times volume\ of\ dry\ concrete = 1.5 \times 14.28 = 21.44 m^3$$

Que 49. Whenever the white washing on distempering is done on corrugated iron sheets, in the estimation the plan area of the sheets is Increased by

a) 2%
b) 7%
c) 10%
d) 20%

Que 49. Whenever the white washing on distempering is done on corrugated iron sheets, in the estimation the plan area of the sheets is Increased by

a) 2%

b) 7%

c) 10%

d) 20%

Que 50. The following item of earthwork is not measured separately.

a) Setting out of works

b) Site clearance

c) Dead men

d) All options are correct

Que 50. The following item of earthwork is not measured separately.

a) Setting out of works

b) Site clearance

c) Dead men

d) All options are correct

Que 51. Pick up the correct statement from the following

a) In order to check up the average depth of excavation; Dead man's are tested at the mid-widths of borrow pits

b) the earthwork calculation in excavation is made from the difference in levels obtained with a level

c) The earthwork done in excavation is to form the road embankment includes the formation of correct profiles and depositing the soil in layers

d) All options are correct

Que 51. Pick up the correct statement from the following

a) In order to check up the average depth of excavation; Dead man's are test at the mid-widths of borrow pits

b) the earthwork calculation in excavation is made from the difference in levels obtained with a level

c) The earthwork done in excavation is to form the road embankment includes the formation of correct profiles and depositing the soil in layers

d) All options are correct

Que 52. A cement concrete road is 1000m long, 8m wide and 15 cm thick over the sub-base of 10 cm thick gravel. The cubic content of concrete (1 : 2 :4) for the road specified in is

a) 300 m^3

b) 600 m^3

c) 900 m^3

d) 1200 m^3

Que 52. A cement concrete road is 1000m long, 8m wide and 15 cm thick over the sub-base of 10 cm thick gravel. The cubic content of concrete (1 : 2 :4) for the road specified in is

a) 300 m^3

b) 600 m^3

c) 900 m^3

d) 1200 m^3

$$cubic\ content\ of\ concrete = 1000 \times 8 \times 0.15$$

Que 53. For 100 sq. m. cement concrete (1 : 2 :4) 4cm thick floor; the quantity of cement required is

a) 0.90 m^3

b) 0.94 m^3

c) 0.98 m^3

d) 1.00 m^3

Que 53. For 100 sq. m. cement concrete (1 : 2 :4) 4cm thick floor; the quantity of cement required is

a) 0.90 m^3

b) 0.94 m^3

c) 0.98 m^3

d) 1.00 m^3

$$volume\ of\ wet\ concrete\ required = 100 \times 0.04 = 4m^3$$

$$volume\ of\ dry\ concrete\ required = 1.5 \times 4 = 6m^3$$

$$quantity\ of\ cement\ required = \frac{1}{1+2+4} \times 6 = 0.88m^3$$

Que 54. Pick up the excavation where measurements are made is square meters for payment.

A) Ordinary cuttings up to 1 m

B) Surface dressing up to 15 cm depths

C) Surface excavation upto 30 cm depths

Options:

a) A only

b) B only

c) C only

d) Both B and C

Que 54. Pick up the excavation where measurements are made is square meters for payment.

A) Ordinary cuttings up to 1 m

B) Surface dressing up to 15 cm depths

C) Surface excavation upto 30 cm depths

Options:

a) A only

b) B only

c) C only

d) Both B and C

Que 55. Brick walls are measured in square metre if the thickness of the wall is

a) 10 cm

b) 15 cm

c) 20 cm

d) None of these

Que 55. Brick walls are measured in square metre if the thickness of the wall is

a) 10 cm

b) 15 cm

c) 20 cm

d) None of these

Que 56. The brick-work is measured in square metre in case of

a) Honey comb brick work

b) Brick flat soling

c) half brick walls on the partion

d) All option are correct

Que 56. The brick-work is measured in square metre in case of

a) Honey comb brick work

b) Brick flat soling

c) half brick walls on the partion

d) All option are correct

Que 57. What is the approximate cost of the complete labour a percentage of the total cost of the building.

a) 0.1

b) 0.25

c) 0.4

d) 0.025

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a) 0.1

b) 0.25

c) 0.4

d) 0.025

Que 58. The nominal lead and lift allowed for the earthwork in the excavation of the foundation are

a) 50 m and 2 m

b) 30 m and 2 m

c) 30 m and 1.5 m

d) 20 m and 1 m

Que 58. The nominal lead and lift allowed for the earthwork in the excavation of the foundation are

a) 50 m and 2 m

b) 30 m and 2 m

c) 30 m and 1.5 m

d) 20 m and 1 m

Que 59. A cement concrete road is 1000 m long 8m wide and 15 cm thick over the sub-base of 10 cm thick gravel. The box cutting in road crust is_____.

a) 500 m^3

b) 1000 m^3

c) 1500 m^3

d) 2000 m^3

Que 59. A cement concrete road is 1000 m long 8m wide and 15 cm thick over the sub-base of 10 cm thick gravel. The box cutting in road crust is_____.

a) 500 m^3

b) 1000 m^3

c) 1500 m^3

d) 2000 m^3

$$box\ cutting = cubic\ content\ of\ concrete$$

$$= (1000 \times 8 \times 0.15) + (1000 \times 8 \times 0.1)$$

Que 60. The volume (in m^3) of coarse aggregate required to make 100 m^3 of 1:2:4 concretes is

a) 84

b) 86

c) 92

d) 96

Que 60. The volume (in m^3) of coarse aggregate required to make 100 m^3 of 1:2:4 concretes is

a) 84

b) 86

c) 92

d) 96

$$\boldsymbol{for\ cement\ sand\ aggregate = 1:2:4}$$

$$\boldsymbol{volume\ of\ coarse\ aggregate\ in\ 100m^3 of\ concrete = \frac{4}{1+2+4} \times 100 = 57.14\ m^3}$$

$$\boldsymbol{volume\ of\ dry\ concrete\ in\ 100m^3 of\ concrete = 1.5 \times 57.14 = 85.7m^3}$$

Que 61. The concrete work for the following part of the building of specified thickness is measure in square meters _____.

a) Roof slabs

b) Floors

c) D.P.C.

d) All options are correct

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a) Roof slabs

b) Floors

c) D.P.C.

d) All options are correct

Que 62. The item of steel work which is measured in Sq. m is _____.

a) Collapsible gates

b) Rolling shutters

c) Steel doors

d) All options are correct

Que 62. The item of steel work which is measured in Sq. m is _____.

a) Collapsible gates

b) Rolling shutters

c) Steel doors

d) **All options are correct**

Que 63. For 12 mm thick cement plastering 1 : 6 on 100 Sq. m, new brick work, the quantity of cement required is _____.

a) 0.200 m^3

b) 0.217 m^3

c) 0.340 m^3

d) None of these

Que 63. For 12 mm thick cement plastering 1 : 6 on 100 Sq. m, new brick work, the quantity of cement required is _____.

a) 0.200 m^3

b) 0.217 m^3

c) 0.340 m^3

d) None of these

$$quantity\ of\ mortar = 100m^2 \times 0.012m = 1.2m^3$$

$$for\ 1:6\ cement\ plastering$$

$$volume\ of\ wet\ cement\ reqd = \frac{1.2}{1+6} = 0.17m^3$$

$$volume\ of\ dry\ cement\ reqd = 1.25 \times 0.17 = 0.215m^3$$

Que 64 . Pick up the INCORRECT statement from the following

a) No deduction is made for the volume occupied by reinforcement

b) No deduction is made for the opening up to 0.1 Sq. m

c) No deduction is made for volumes occupied by pipe, not exceeding 100 Sq. cm in cross-section

d) None of these

Que 64 . Pick up the INCORRECT statement from the following

a) No deduction is made for the volume occupied by reinforcement

b) No deduction is made for the opening up to 0.1 Sq. m

c) No deduction is made for volumes occupied by pipe, not exceeding 100 Sq. cm in cross-section

d) None of these

Que 65. Calculate the cost (Rs.) of 100mm thick brick lining of a septic tank of size 5m × 3m × 1.5m, if the rate of lining of Rs. 200 per square metre.

a) 4500
b) 4800
c) 5400
d) 7800

Que 65. Calculate the cost (Rs.) of 100mm thick brick lining of a septic tank of size 5m × 3m × 1.5m, if the rate of lining of Rs. 200 per square metre.

a) 4500

b) 4800

c) 5400

d) 7800

$$\boldsymbol{Area\ of\ lining = 2(L + B)H = 2(5 + 3)1.5 = 24m^2}$$

$$\boldsymbol{Cost\ of\ lining = 200 \times 24 = Rs.4800}$$

Que 66. No deduction is made for opening in estimation of masonary work up to_____.

a) 1 square centimeter

b) 10 square centimeter

c) 100 square centimeter

d) 1000 square centimeter

Que 66. No deduction is made for opening in estimation of masonary work up to_____.

a) 1 square centimeter

b) 10 square centimeter

c) 100 square centimeter

d) 1000 square centimeter

Que 67. Calculate the weight (Kg) per meter length of 25 mm diameter steel bar place at a spacing of 250 mm center by center for 1 meter.

a) 0.96

b) 3.85

c) 7.7

d) 15.4

Que 67. Calculate the weight (Kg) per meter length of 25 mm diameter steel bar place at a spacing of 250 mm center by center for 1 meter.

a) 0.96

b) 3.85

c) 7.7

d) 15.4

$$weight\ of\ bars\ per\ meter\ length = number\ of\ bars \times area\ of\ bar \times density$$

$$number\ of\ bars = \frac{1000}{250} = 4$$

$$weight\ of\ bars\ per\ meter\ length = 4 \times \frac{\pi}{4} 0.025^2 \times 7850 = 15.41kg$$

Que 68. Which one of the following method is used for the approximate estimation?

a) Both central line and short wall and long wall method

b) Central line method

c) Plinth area method

d) Short wall and long wall method

Que 68. Which one of the following method is used for the approximate estimation?

a) Both central line and short wall and long wall method

b) Central line method

c) Plinth area method

d) Short wall and long wall method

Que 69. Deduction at T-junction of the wall for total length of the central line is_____.

a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

Que 69. Deduction at T-junction of the wall for total length of the central line is_____.

a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

Que 70. For estimation of painted area of semicorrugated asbestos cement sheets, percentage increase in area above plain area is____.

a) 0.1

b) 0.14

c) 0.2

d) 0.25

Que 70. For estimation of painted area of semicorrugated asbestos cement sheets, percentage increase in area above plain area is____.

a) 0.1

b) 0.14

c) 0.2

d) 0.25

Que 71. What is unit of measuring cornice?

a) Cubic metre

b) Number

c) Running metre

d) Square metre

Que 71. What is unit of measuring cornice?

a) Cubic metre

b) Number

c) Running metre

d) Square metre

Que 72. Calculate the number of bricks in 20 cubic metres brick works.

a) 500

b) 1000

c) 10000

d) 100000

Que 72. Calculate the number of bricks in 20 cubic metres brick works.

a) 500

b) 1000

c) 10000

d) 100000

$$Effective\ size\ of\ modular\ brick = 20cm \times 10cm \times 10cm$$

$$Number\ of\ bricks = \frac{20}{.20m \times .10m \times .10m} = 10000$$

Que 73. Calculate the area (square metre) of the formwork required for a beam of 2m span and cross-section dimension of 400mm × 200mm

a) 0.8

b) 0.16

c) 1.2

d) 2

Que 73. Calculate the area (square metre) of the formwork required for a beam of 2m span and cross-section dimension of 400mm × 200mm

a) 0.8

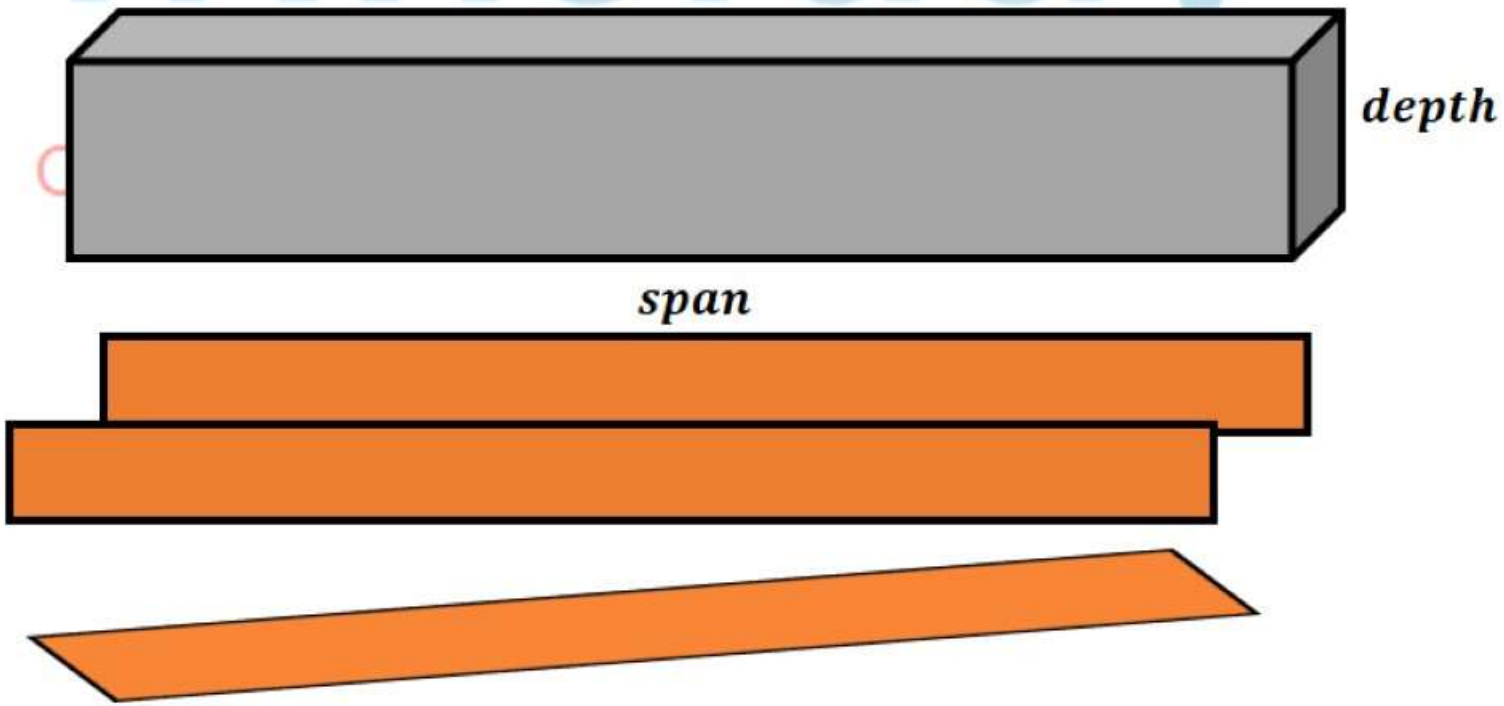
b) 0.16

c) 1.2

d) 2

$$area\ of\ formwork = [(2 \times depth) + width] \times span$$

$$area\ of\ formwork = [(2 \times 0.4) + 0.2] \times 2 = 2m^2$$



Que 74. Accuracy in the measurement of the thickness of slab or sectional dimension of column and beam (in centimetre) should be

a) 0.5
b) 1
c) 5
d) 10

Que 74. Accuracy in the measurement of the thickness of slab or sectional dimension of column and beam (in centimetre) should be

a) 0.5

b) 1

c) 5

d) 10

Que 75. Calculate the quantity (cubic meter) of fine aggregate required for construction of a circular water tank of 3.5m diameter and 5m height, if M25 cement concrete is used.

a) 12
b) 18.5
c) 37
d) 48

Que 75. Calculate the quantity (cubic meter) of fine aggregate required for construction of a circular water tank of 3.5m diameter and 5m height, if M25 cement concrete is used.

a) 12

b) 18.5

c) 37

d) 48

$$\textbf{for M25concrete ratio of cement sand and aggregate is } 1:1:2$$

$$\textbf{volume of tank} = \frac{\pi}{4}d^2 \times h = \frac{\pi}{4} \times 3.5^2 \times 5 = 48.08m^3$$

$$\textbf{quantity of fine aggregates reqd} = \frac{1}{4} \times 48.08 \times 1.5 = 18.03m^3$$

Que 76. Which of the following is the CORRECT statement for length of the short wall, as one more from earthwork to brick work in super structure in long and short wall method?

a) Its value decreases

b) It value depends upon the length of wall

c) its value increases

d) It value remains same

Que 76. Which of the following is the CORRECT statement for length of the short wall, as one more from earthwork to brick work in super structure in long and short wall method?

a) Its value decreases

b) It value depends upon the length of wall

c) its value increases

d) It value remains same

ANALYSIS OF RATES

- **The process of determining the rate of any work in engineering projects like earthwork, brickwork, plastering, painting etc. is called RATE ANALYSIS.**
- **The rates of these work further help in determining the cost of particular work and in turn the cost of project.**

ANALYSIS OF RATES

- **Need of rate analysis:**
  1. **To determine the actual cost per unit item.**
  2. **To work out the economical use of materials and processes in completion of particular work.**
  3. **To calculate cost of extra items not included in the contract bond but are required.**
  4. **To revise the schedule of rates as per the present cost of materials or labour or technologies.**

ANALYSIS OF RATES

- **Factors affecting rate analysis:**
  1. **Specifications of work and materials used (quality, proportion etc.)**
  2. **Quantity of materials and their cost.**
  3. **Cost of labour and their wages.**
  4. **Location of site of work and its distance from source and their conveyance charges.**
  5. **Profit**
  6. **Overhead and establishment charges.**

ANALYSIS OF RATES

- **The analysis of rates is worked out for the unit payment of the particular item of work under two heads:**
  1. **Material**
  2. **Labour**
- ***Cost of items at work = material cost + labour cost***
- **Other items included are**
  1. **Tools and plants = 2.5 to 3% of the labour cost**
  2. **Transportation cost for more than 8kms is considered**
  3. **Water charges = 1.5 to 2% of the total cost**
  4. **Contractor's profit upto 10%**

ANALYSIS OF RATES

- **COST OF MATERIAL:**
  - **It is taken as the cost incurred while material is delivered at site work.**
  - **It is inclusive of first cost(cost at origin), conveyance charges, taxes etc.**

- **LEAD STATEMENT:**
  - **The distance between the source of availability of material and construction site is known as lead and is measured in kilometres.**
  - **The conveyance cost of material depends upon lead.**
  - **The lead statement gives total cost of materials per unit item including first cost, conveyance loading unloading etc.**

ANALYSIS OF RATES

- **LEAD STATEMENT:**

MATERIAL	COST AT SOURCE IN RUPEES	PER	LEAD IN KM	CONVEYANCE CHARGES IN RUPEES	TOTAL CONVEYANCE CHARGE	TOTAL COST IN RUPEES
Rough stone	250	cum	15	5.00/cum	5x15=75	250+75=325

ANALYSIS OF RATES

- **LEAD:**
  - **During the earthwork, the average horizontal distance between the centre of excavation to centre of deposition is called LEAD.**
  - **It is normally calculated in multiples of 50m.**

- **LIFT:**
  - **During earthwork, the average height through which soil has to be lifted from source to the place of spreading is called LIFT.**
  - **The first lift is taken upto 2m.**
  - **The extra lift is counted for 1m after the first lift and so on.**

ANALYSIS OF RATES

- **COST OF LABOUR:**
  - **The labour is classified as:**
    1. **Skilled 1st class**
    2. **Skilled 2nd class**
    3. **Unskilled**
  - **30% of the skilled labour provided in the data may be taken as 1st class and remaining 70% as 2nd class.**

ANALYSIS OF RATES

- **CONTRACTOR'S PROFIT:**
  - **This is 8-10% of the net profit that is allowed for the contractor.**
  - **10% is not allowed on steel and cement.**

- **OVERHEAD COSTS:**
  - **This comes to 6-8% of the total cost of the project.**
  - **These include all the indirect expenses incurred during the project.**

ANALYSIS OF RATES

- **TASK OR OUT TURN WORK:**
  - **The capacity of doing work by a skilled labour in the form of quantity of work per day is known as task or out turn work.**
  - **More common in developed or urban cities as compared to small towns.**

ANALYSIS OF RATES

GENERAL SPECIFICATIONS:

- **This gives the nature and class of the work and materials, to be used in the various parts of work, from the foundation to the superstructure.**
- **It is a short description of different parts of work specifying materials, proportions, qualities, etc.**
- **General specifications give general idea of the whole work or structure and are useful for preparing for estimate.**

DETAILED SPECIFICATIONS

1. EXCAVATION, FILLING AND BACKFILLING:

- **Includes:**
  - **excavation of foundations, trenches, pits and over areas, correct to dimensions given in the drawing**
  - **stacking the useful materials as directed within the lead specified**
  - **refilling around the foundation and into the plinth with selected useful excavated earth**
  - **disposing off the surplus earth OR materials within specified lead**
  - **finishing the surface to proper levels, slopes and camber etc. all complete.**

DETAILED SPECIFICATIONS

1. EXCAVATION, FILLING AND BACKFILLING:

- **Site Clearance**
  - Before the earth work is started the area coming under cutting and filling shall be removed up to a distance of 150 metres outside the periphery of the area under clearance.
- **Roots and Vegetation clearance**
  - The roots of trees shall be removed to a minimum depth of 60 cm below ground level or a minimum of 30 cm below formation level whichever is lower.
- **Setting out and making profiles**
  - Masonry or concrete pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work.

DETAILED SPECIFICATIONS

1. EXCAVATION, FILLING AND BACKFILLING:

- **Excavation**
  - **The ground levels shall be taken at 5 to 15 metres intervals in uniformly sloping ground and at closer distance.**
  - **The item in the schedule of quantities shall specify the excavation in trenches or over areas.**
    - **Excavation in foundation trenches - depth in trenches for foundation not exceeding 1.5m in width or 10 sq.metres .**
    - **Excavation over areas - excavation exceeding 1.5m in width as well as 10sq.metres. on plan (excluding trenches for pipes, cables etc.) and exceeding 30cm in depth**
    - **Surface excavation - Excavation exceeding 1.5m in width as well as 10sq.metres. on plan but not exceeding 30cm in depth**

DETAILED SPECIFICATIONS

- **CLASSIFICATION OF EARTHWORK:**
  1. **All types of Soils, Murrum, Boulders:**
     - **This includes earth, murrum, top deposits of agricultural soil, reclaimed soil, clay, sand or any combination of soft and hard murrum, shingle etc.**
     - **Boulders not more than 0.03 cum. in volume found during the course of excavation shall also fall be excavated.**
  2. **Excavation in Soft Rock:**
     - **This includes all materials which are rock or hard conglomerate, all decomposed weathered rock, highly fissured rock, old masonry, boulders bigger than 0.03 cum, in volume but not bigger than 0.5 cum. and other varieties of soft rock which can be removed only with pick axes, crow bars, wedges and hammers with some difficulty.**

DETAILED SPECIFICATIONS

- **CLASSIFICATION OF EARTHWORK:**

3. Excavation in Hard Rock :

- **This includes all rock other than soft rock having approximate volume more than 0.5 cum. plain or reinforced cement concrete, which can best be removed by chiseling and wedging where blasting cannot be permitted owing to any restriction at site.**

❖ **Any excavation if taken below the specified depths and levels, the contractor shall at his own cost fill up such over cut to the specified level with**

- **cement concrete 1:4:8 in case of excavation in all types of soils and**
- **With cement concrete 1:2:4 in case of excavation soft and hard rock.**

MODE OF MEASUREMENTS

1. All excavation in areas having depth more than 30cm. pits, trenches etc. shall be measured net.
2. Excavation in areas having depths less than 30 cms. shall be measured as surface excavation on square meter basis, mentioning the average depth of excavation.
3. Where direct measurements of rock excavation are not possible, volume of rock can be calculated on the basis of length, breadth, and depth of stacks made at site.
4. The net volume shall be worked out by reducing it by 40% taking the voids into consideration as 40%.

VALUATION

- **Valuation means fixation of cost or return expected of a building, engineering structure project (Govt. or private), at present days rates.**
- **The value of a structure may be more or less depending upon the present utility of a structure.**
- **Necessity of Valuation of a property:**
  - **(i) Rent fixation(generally taken as 6% of the valuation of the property.)**
  - **(ii) For buying and selling.**
  - **(iii) Acquisition of property by Govt.**
  - **(iv) To be mortgaged with bank or any other society to raise loan.**
  - **(v) For various taxes to be given and fixed, by the Municipal Committee.**
  - **(vi) Insurance.**

VALUATION

- **Factors considered in valuation:**
  1. **Type of building**
  2. **Location**
  3. **Building structure and durability**
  4. **The quality of materials used in construction**
  5. **Size of the building**

VALUATION

- **Value:**
  - Present day cost of a Engineering structure (Saleable value)
  - It may be higher or lower than the cost
- **Cost:**
  - Original cost of construction.
  - It is used to find out the loss of value of property due to various reasons.
- **Gross Income :**
  - It is the total amount of the income including all receipts from various sources.
  - The outgoings, the operational and collection charges are not deducted in this.
- **Net Income:**
  - It is the amount left after deducting all the outgoings, operational and collection expenses from the gross income.

VALUATION

- **Outgoings:**
  - **The expenses that are required to be incurred in order to maintain the revenue of the building.**
- **Various outgoings are:**
  - **Taxes:-**
    - **These are annual taxes paid by the owner, such as wealth tax, property tax and municipal taxes (varies from 10% to 25% of net income).**
  - **Management:-**
    - **Upto 10% of the gross revenue is kept aside for these expenses.**
    - **This includes, chowkidar, sweeper etc. applicable only for big buildings or apartments**
  - **Repairs:-**
    - **1.5 % of the total construction is set aside for annual repairs of the building.**
    - **These repairs are must to maintain the building.**
    - **It is also calculated as 10% of the gross income.**

VALUATION

- **Various outgoings are:**
  - **Sinking fund:-**
    - **A certain amount of the gross rent is set aside annually as sinking fund to accumulate the cost of construction when the life of building is over.**

$$I = \frac{Si}{(1+i)^n - 1}$$

I = Annual instalment required
n = Number of years required to create sinking fund.
i = Rate of interest expressed in decimal
S = Amount of sinking fund.

  - **Miscellaneous:-**
    - **This is again suitable for big buildings.**
    - **Lighting of common place, expenditure of liftman etc. are to be paid by the owner.**

VALUATION

- **Various outgoings are:**
  - **Loss of Rent:-**
    - **This is also an outgoing in case a building in not fully occupied by the tenants.**
    - **This has to be deducted from gross income.**
  - **Insurance:-**
    - **Premium given against fire or for theft policy.**

VALUATION

- **Types of Value:**
  - **Market value**
  - **Scrap value**
  - **Salvage value**
  - **Rentable value**
  - **Book value**

VALUATION

- **Types of Value:**
  1. **Market value:**
     - It is defined as the value which a property can fetch when sold out in open market.
     - This value is variable, depending upon the will to buy or sell.
  2. **Scrap value**
     - It is defined as the value of materials of dismantled buildings.
     - It is usually 10% of the total cost of the construction.
  3. **Salvage value**
     - It is the value of building at the end of utility period without being dismantled.
  4. **Rentable value**
     - It is the net annual letting value of a property obtained after deducting the amount of yearly repairs from the gross income.
  5. **Book value**
     - It is the amount of a property shown in the books, after allowing necessary depreciations year-wise.
     - The book value is independent of market-value.

VALUATION

- **Obsolescence:-**
  - The value of property decreases if its style and design are outdated i.e. rooms not properly set, thick walls, poor ventilation etc. the reasons of this is fast changing techniques of construction, design, ideas leading to more comfort etc.

- **Free hold Property:-**
  - Any property which is in complete possession of the owner is known as free hold property.
  - The owner can use the property in an way he likes. But he will have to follow constraints fixed by town planners or Municipality before doing any construction.

- **Lease hold:-**
  - If a property is given to some person on yearly payment basis by the free holder, then the property is called lease hold property and the person who takes the property is called Lease-holder.
  - In case of building, the lease is for 99 years to 9 years.

VALUATION

- **Easement:-**
  - An owner getting over the property of another person, the following facilities are known as easements.
    - Facility of running water and sewer pipes through other's land.
    - Facility of air and light.
    - Facility of drainage of rain water.
    - Facility of access.
  - The one who gives facilities is known as SERVANT while the one who access the facilities is known as DOMINANT OWNER.

- **Building Cost Index:**
  - A building cost index indicates the increase and decrease of the cost above the cost at a certain base year and is expressed by a percentage rise & fall.

VALUATION

- **Capitalized value:-**
  - **It is defined as the amount of money whose annual interest at the highest prevailing rate will be equal to the net income received from the property.**
  - **To calculate the capitalized value, it is necessary to know highest rate of interest prevailing on such properties and net income form the property.**

- **Annuity:-**
  - **The return of capital investment in the shape of annual instalments (monthly, quarterly, half yearly & yearly) for a fixed number of years is known as annuity.**

VALUATION

- **Depreciation:**
  - A structure, after sometimes gradually losses some of its value due to its constant use and some other similar reasons, such as
    (a) The property in neglected condition
    (b) The property being away from schools & market
    (c) Design being out of fashion
    (d) Poor specifications followed which requiring maintenance.
  - The loss thus involve in the value of properties known as Depreciation.

$$D = P\left(\frac{100 - rd}{100}\right)^n$$

D = Depreciated Value
P = Present Value
rd = Fixed percentage of depreciation
n = number of year the building has been constructed

Que 75. _____is the technique of estimating or determining the fair price or value of a property such as a building, a factory, other engineering structures of various types.

a) depreciation
b) capital value
c) valuation
d) taxation

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a) depreciation

b) capital value

c) valuation

d) taxation

Que 76. A pumping set with a motor has been installed in a building at a cost of Rs.2500.00. Assuming the life of the pump as 15 years, work out the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 4% compound interest.

a) Rs.355
b) Rs.125
c) Rs.185
d) Rs.1950

$$I = \frac{Si}{(1+i)^n - 1}$$

$$I = \frac{2500 \times 0.04}{(1+0.04)^{15} - 1} = 125$$

Que 76. A pumping set with a motor has been installed in a building at a cost of Rs.2500.00. Assuming the life of the pump as 15 years, work out the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 4% compound interest.

a) Rs.355

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$$I = \frac{Si}{(1+i)^n - 1}$$

$$I = \frac{2500 \times 0.04}{(1+0.04)^{15} - 1} = 125$$

Que 77. The objective of creating the sinking fund is to accumulate the sufficient money to.

a) Meet cost of construction and replacement after its useful use

b) Pay taxes

c) Recover the cost of construction

d) Save money for future

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a) Meet cost of construction and replacement after its useful use

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Sinking fund:-

A certain amount of the gross rent is set aside annually as sinking fund to accumulate the cost of construction when the life of building is over.

$$I = \frac{Si}{(1+i)^n - 1}$$

Que 78. Obsolescence is the annual periodic payments for repayments of the capital amount invested by a party.

a) True

b) False

Que 78. Obsolescence is the annual periodic payments for repayments of the capital amount invested by a party.

a) True

b) False

Que 79. Scrap value is the net annual letting value of a property, which is obtained after deducting the amount of yearly repairs from the gross income.

a) True

b) False

Que 79. Scrap value is the net annual letting value of a property, which is obtained after deducting the amount of yearly repairs from the gross income.

a) True

b) False

VALUATION

- **Various methods of valuation:**
  1. **Depreciation method of valuation:**
  2. **Valuation based on cost**
  3. **Valuation based on profit**
  4. **Valuation by Development method**
  5. **Rental method of valuation**

VALUATION

- **Various methods of valuation:**

1. **Depreciation method of valuation:**
   - **In this method, the structure is divided into four parts for calculating depreciation: Walls, Roofs, Floors, Doors and Windows.**
   - **First method** $D = P\left(\frac{100-rd}{100}\right)^n$

     D = Depreciated Value
     P = Present Value
     rd *= Fixed percentage of depreciation*
     n *= number of year the building has been constructed*

   - **Second method** $D = \frac{C-S}{n}$

     D = Depreciated Value
     C = Original Cost
     S = Scrap Value
     n *= life of the property*

VALUATION

- **Various methods of valuation:**

2. **Value based on cost:**
   - In this method, the actual cost of the construction is found out and valuation is done after considering depreciations and considering the type of construction and design of the construction.

3. **Valuation based on profit:**
   - Under this sub-head, valuation of cinemas, theatres, hotels, banks, big shop etc. located at suitable places is done where profit is of capitalized value.
   - The capitalized value is calculated by multiplying year's purchase with net profit.
   - The net profit is worked out after deducting all possible outgoings and expenditures from the gross income.
   - In such cases the cost will be too high as compared with the cost of construction actually incurred.

VALUATION

- **Various methods of valuation:**

4. **Value by development method:**
   - This method is also used for working out the value of a building.
   - In certain cases, some additions, alterations and improvements are carried out which increases the cost of the building.

5. **Rental method of valuation:**
   - In this method, the rent of the building is used as the base for calculating the value of the building.

Que 80. In straight line method, the annual depriciation of the property is

a) $\frac{Original\ Cost - annual\ sinking\ fund}{Life\ in\ year}$

b) $\frac{Life\ in\ year}{Original\ COst + Scrap\ Value}$

c) $\frac{Original\ Cost - scrap\ value}{Life\ in\ year}$

d) $\frac{Original\ Cost + scrap\ value}{Life\ in\ year}$

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c) $\boldsymbol{\frac{Original\ Cost - scrap\ value}{Life\ in\ year}}$

d) $\frac{Original\ Cost + scrap\ value}{Life\ in\ year}$

Que 81. The knowledge of which items is necessary for for analysis of rates?

a) Contractor's profit
b) Tools and plant expenditure
c) Task of a labour in one day
d) All of the above

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d) All of the above

Que 82. The value of property during its useful life based on purchase value and depreciation etc. is known as:

a) Junk value

b) Salvage value

c) Scrap value

d) Book value

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a) Junk value

b) Salvage value

c) Scrap value

d) Book value

Que 83. The value of the property at the end of its useful life (without being dismantled) is known as:

a) Salvage value

b) Scrap value

c) Book value

d) Junk value

Que 83. The value of the property at the end of its useful life (without being dismantled) is known as:

a) Salvage value

b) Scrap value

c) Book value

d) Junk value

Que 84. Find depreciation during first five years of a cement concrete structure is

a) Zero %

b) 0.5 %

c) 1 %

d) 2 %

Que 84. Find depreciation during first five years of a cement concrete structure is

a) Zero %

b) 0.5 %

c) 1 %

d) 2 %

Que 85. The value of demolished material is known as

a) Scrap value

b) Salvage value

c) Resultant value

d) Material value

Que 85. The value of demolished material is known as

a) Scrap value

b) Salvage value

c) Resultant value

d) Material value

Que 86. The value of the property (without being dismantled) at the end of the useful life period is known as

a) Scrap value

b) Salvage value

c) Junk value

d) Book value

Que 86. The value of the property (without being dismantled) at the end of the useful life period is known as

a) Scrap value

b) Salvage value

c) Junk value

d) Book value

Que 87. Scrap value of a property may be____.

a) Both negative or positive

b) Constant

c) Negative

d) Positive

Que 87. Scrap value of a property may be____.

a) Both negative or positive

b) Constant

c) Negative

d) Positive

Que 88. Calculate the annual deprecation (Rs.) of a machine having initial cost of Rs. 10000. The scrap value is Rs. 1000 and useful life of 30 years.

a) 300
b) 367
c) 1133
d) 333333

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a) 300

b) 367

c) 1133

d) 333333

$$annual\ deprecation = \frac{initial\ cost - scrap\ value}{useful\ life}$$

Que 89. Calculate the annual percentage of depreciation of a machine using the constant percentage method, if purchasing cost is Rs. 12000 and scrap value is Rs. 3000 and life of the machine is 8 years.

a) 9.37
b) 16
c) 26.67
d) 33.33

Que 89. Calculate the annual percentage of depreciation of a machine using the constant percentage method, if purchasing cost is Rs. 12000 and scrap value is Rs. 3000 and life of the machine is 8 years.

a) 9.37

b) 16

c) 26.67

d) 33.33

$$annual\ deprecation = \frac{initial\ cost - scrap\ value}{useful\ life} = \frac{12000-3000}{8} = 1125$$

$$annual\ deprecation\% = \frac{1125}{12000} \times 100 = 9.37\%$$

90. Which of the following is the unit of measurement for rivets?

a) Bags
b) Cubic meter
c) Numbers
d) Quintal

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a) Bags

b) Cubic meter

c) Numbers

d) Quintal

Que 91. Which of the following statement is CORRECT for units of measurement?

a) Bands of specified width are measured in running meter.

b) Work consists of the linear measurement is measured in square meter

c) Single units are measured in meter

d) Work consists of a real surface is measured in cubic meter

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a) Bands of specified width are measured in running meter.

b) Work consists of the linear measurement is measured in square meter

c) Single units are measured in meter

d) Work consists of a real surface is measured in cubic meter

Que 92. Which of the following area is NOT included in the plinth area of the building?

a) Area of the lofts

b) Area of Barsati at terrace level

c) Area of walls at floor level

d) Porches of non cantilever type

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a) Area of the lofts

b) Area of Barsati at terrace level

c) Area of walls at floor level

d) Porches of non cantilever type

Que 93. Threading in the iron is measured in_____.

a) Centimeter

b) Kilograms

c) Number

d) Square centimeter

Que 93. Threading in the iron is measured in_____.

a) Centimeter

b) Kilograms

c) Number

d) Square centimeter

Que 94. Which of the following is the purpose of the valuation?

a) Approximate estimation of cost

b) Analysis of rate

c) Detailed estimation of cost

d) Taxation

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a) Approximate estimation of cost

b) Analysis of rate

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Que 95. An electric generator is installed in the building of cost of Rs. 50000. Calculate the annual sinking fund (Rs.) required to be deposited to accumulate the whole amount of 5% compound interest. Assume the life of the electric generator as 10 years.

a) 1535
b) 30695
c) 3975
d) 79503

Que 95. An electric generator is installed in the building of cost of Rs. 50000. Calculate the annual sinking fund (Rs.) required to be deposited to accumulate the whole amount of 5% compound interest. Assume the life of the electric generator as 10 years.

a) 1535

b) 30695

c) 3975

d) 79503

$$Sinking\ fund = (P - S) \times \frac{i}{(1+i)^n - 1}$$

$$Sinking\ fund = (50000 - 0) \times \frac{0.05}{(1+0.05)^{10} - 1}$$

Que 96. Calculate the quantity of sand required (in cubic meter) in 20 cubic meters of reinforced cement concrete (1:2:4)

a) 2.87

b) 4.4

c) 5.7

d) 8.8

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a) 2.87

b) 4.4

c) 5.7

d) 8.8

$$quantity\ of\ sand\ required\ for\ concrete = \frac{2}{(1+2+4)} \times 20 = 5.71m^3$$

$$quantity\ of\ sand\ required\ for\ wet\ concrete = 1.54 \times 5.71 = 8.8m^3$$

Que 97. Reduction at cross wall for total length of the central line is_____.

a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

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a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

Que 98. Accuracy in measurement of the area should be_____.

a) 1 square centimeter

b) 10 square centimeter

c) 100 square centimeter

d) 1 square meter

Que 98. Accuracy in measurement of the area should be_____.

a) 1 square centimeter

b) 10 square centimeter

c) 100 square centimeter

d) 1 square meter

Que 99. The length, width and height of a wall are given as 800 cm, 500 cm, and 50 cm respectively, what will be the total cost (Rs.) of brick work, if the rate of brickwork is Rs. 320 per cubic metre?

a) 4000
b) 6400
c) 10500
d) 12860

Que 99. The length, width and height of a wall are given as 800 cm, 500 cm, and 50 cm respectively, what will be the total cost (Rs.) of brick work, if the rate of brickwork is Rs. 320 per cubic metre?

a) 4000

b) 6400

c) 10500

d) 12860

$$total\ cost = quantity\ of\ brickwork \times rate$$

$$total\ cost = 8 \times 5 \times 0.5 \times 320 = Rs.6400$$

Que 100. What is the total cost (Rs.) according to approximate estimate of hostel building with capacity of 75 beds? The altogether cost per bed is given as Rs. 20000.

a) 500000
b) 850000
c) 1500000
d) 5500000

Que 100. What is the total cost (Rs.) according to approximate estimate of hostel building with capacity of 75 beds? The altogether cost per bed is given as Rs. 20000.

a) 500000

b) 850000

c) 1500000

d) 5500000

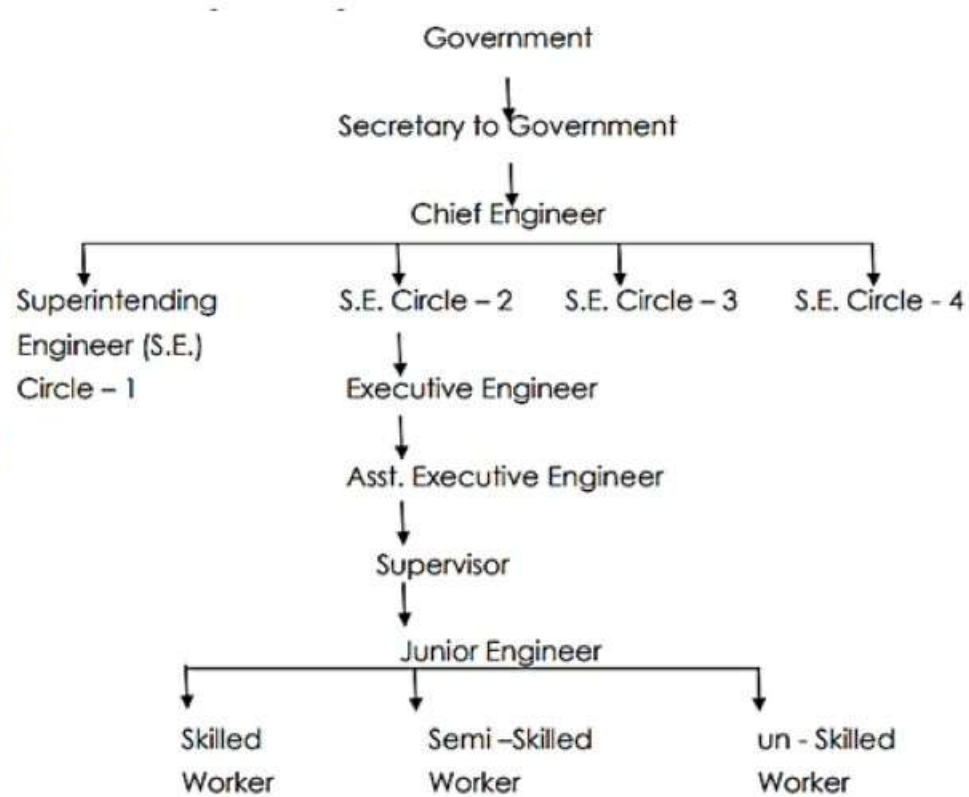
$$total\ cost = number\ of\ beds \times rate$$

$$total\ cost = 75 \times 20000 = Rs.\ 1500000$$

Organization chart of PWD

- The organizational structure has six tier **hierarchy** i.e.,

1. Engineer-in-Chief ,
2. Chief Engineer,
3. Superintending Engineer,
4. Executive Engineer,
5. Assistant Engineer and
6. Junior Engineer.



SOME IMPORTANT TERMS

- Quotation:
  - The rates quoted by a contractor in response to tender call are called “quotations”
- Tenders
  - It is defined as an offer in writing to execute a specified work or supply. In this offer, some specific articles are required by the department mentioning approximate rate, under certain conditions of contract. An agreement between the contractor and the department is executed, fixation of is the main clause, for the completion of the job.

SOME IMPORTANT TERMS

- Earnest money:
  - It is a guarantee in the form of money, given by the contractor along with their tenders, confirming their willingness to work for the department.
  - It is generally 2% of the total estimate.
  - In case, if the tender of the contractor is not accepted, the money is refunded immediately.
- Security money
  - This is the money which the contractor has to deposit with the department when the contract is allotted to him.
  - It is 10% of the total estimate.
  - This money also includes earnest money already deposited by the contractor.
  - This deposit is kept as a check so that the conditions of the contract agreed upon are fulfilled, work is in the progress and quality of the work is satisfactory.

SOME IMPORTANT TERMS

- Tender:
  - Tendering usually refers to the process whereby governments and financial institutions invite bids for large projects that must be submitted within a finite deadline.
- Notice Inviting Tenders (N.I.T.)
  - It is prepared by the administrative wing after all the above mentioned formalities are complete including administrative approval, technical sanction, funds, land acquisition etc.
  - Sealed Tenders are invited by giving advertisement in leading newspapers, by sending letters to reputed contractors and displaying notice on notice board of the department.
  - The date of issue of the notice should 4 weeks before the receipt of tenders. Mode to send the earnest money should be mentioned clearly
  - Time, date and place where the drawings can be seen, should also be mentioned in the advertisement. Cost of tender from and its availability should be mentioned. Incomplete tender forms are likely to be rejected as per conditions mentioned.
  - Time, date and place where the drawings can be seen, should also be mentioned in the advertisement. Cost of tender from and its availability should be mentioned. Incomplete tender forms are likely to be rejected as per conditions mentioned.

- Opening of Tender:
  - The tenders are opened at the place mentioned in the tender form i.e. in the office of executive engineer, on the due date and time mentioned.
  - Executive engineer, divisional accountant and office superintendent represent the department on one side and contractors or their representatives are on the other side.
  - The lock of the box in which sealed tenders are dropped by the contractors is opened in the presence of all.
  - After checking the seals of the tender covers, these are opened and are signed by both the parties.
  - Comparative statement is prepared item wise and the it is allotted to the lowest bidder.
  - The competent authority has powers to reject the tender of the lowest bidder, but he has to give reasons and confidential remarks, financial position and reputation of the contractor is also considered.
  - Earnest money to the bidders of rejected tenders is retuned.
  - Signature of each contractor is taken as a token of certificate that tenders were opened in their presence and the allotment has been done to the right bidder

TYPES OF TENDER

1. Open tender
2. Sealed tender
3. Limited tender
4. Single tender
5. Rate contract

TYPES OF TENDER

1. Open tender
   - The client advertises the tender offers in the local newspaper along with the key information of the proposed works and inviting interested contractors.
2. Sealed tender
   - Invited for important or huge projects.
   - Wide publicity given and always written documents are made.
3. Limited tender
   - Only selected number of contactors are invited to quote their rates.
4. Single tender
   - Invitation is given to only one firm to render a service by quoting their rates.
5. Rate contract
   - Supply of items at a fixed rate during the time of contract.

PROCEDURE OF INVITING TENDER

1. Preparation of tender documents.
2. Issue of notice inviting tender.
3. Submission and opening of tenders and their scrutiny.
4. Acceptance of tender and award of contract.

TENDER DOCUMENTS

Tender Documents consist of the following:

1. Tender Drawings
2. The specification
    1. General requirements
    2. Specification of workmanship and materials
3. Bill of Quantities
4. Conditions of Contract
5. Form of Tender
6. Form of Agreement
7. Form of bond

TENDER DOCUMENTS

Tender Documents consist of the following:

1. **Tender Drawings**
   - The purpose of tender drawings is to describe the project in sufficient detail so that the price submitted by the contractor can be expected to be realistic.
   - Drawings must show sufficient detail so that there is not significant change and subsequently no significant change of the cost.
2. **The Specification**
   - General Requirements - It includes relevant details of the site and information on items which do not form part of the permanent works.
   - Specification of workmanship and materials - It deals with the detailed requirements of every trade. The type, the quality and method of fixing (or fabrication) and testing of every item for incorporation in permanent works is described.

TENDER DOCUMENTS

3. Bill of Quantities

- It is like a 'shopping' list
- It lists every work activity or component part necessary for the execution of the (permanent) works.
- Bill of Quantities is essential to cost control.
- Bills of quantities are prepared from tender drawings.

4. Conditions of Contract

- The purpose of the Conditions of Contract is:
  - To define the responsibilities and liabilities of the parties to the contract.
  - To describe the method of administration (by Engineer)
- The Conditions of Contract define the terms under which the work is to be carried out, the relationship between the Employer and the Contractor, the powers of the Engineer and the terms of payment.
- The imposition of conditions of contract which are biased (unfair) in favour of the Employer can be uneconomical.

TENDER DOCUMENTS

5. Form of tender

- It is a standard letter of offer by the Contractor to execute the works.
- It is prepared by the Engineer and signed by the contractor.
- It contains the main points of the offer:
  - Starting date
  - Duration
  - Tender sum

6. Form of Agreement

- To set up names of parties, list of contract documents, signatures of parties, sealed contact documents, signatures, of parties, sealed contact.
- A standard form of agreement is the legal contract between the promoter and the contractor.
- It evidences the agreement of the Employer to pay the price indicated in the contractor's tender and the contractor's agreement to undertake the works in accordance with the tender documents.

TENDER DOCUMENTS

7. Form of bond

- It is signed by both the contractor and a third party evidencing their agreement to pay a sum of money to the Employer in the event of the contractor's default.
- Often, the Employer worries whether the work will be good. Guarantee is provided by a third party (often a bank or an insurance company) to the contractor.
- If the contractor does not complete the work according to the specification (contract documents), he pays sum of money (bond) to the Employer.

CONTRACTS

- When two or more persons have a common intention communicated to each other to create some obligation between them, there is said to be an agreement.
- An agreement which is enforceable by law is a “Contract”.
- According to section 10 of the Indian Contract Act, 1872 only those agreements are enforceable by law which are made by the free consent of parties competent to contract, for a lawful consideration and with a lawful object and are not expressly declared to be void.
- This is subject to any special law according to which contract should be in writing and attested by witnesses.

PARTS OF CONTRACT

1. Offer made by one person called the “Promisor”.
2. Acceptance of offer made by the other person called the “Promisee”.
3. Doing of an act or abstinence from doing a particular act by promisor for promise a called consideration
4. The offer and acceptance would relate to the something which is not prohibited by law.
5. Offer and the acceptance constitute an agreement, which, when enforceable by law, become a contract.
6. In order to make a valid and binding agreement, the party entering into such an agreement should be competent to make such agreement.

PARTS OF CONTRACT

- Steps are
  1. A proposal
  2. Communication of the proposal
  3. A communication of the acceptance of the proposal
- All contracts are agreements but all agreements are not necessarily contracts; agreements not enforceable by law are not contracts.
- According to the Indian contract Act 1872, an agreement is a contract if 'it is made by the free consent of parties competent to contract, for lawful consideration and with a lawful object, and is not expressly declared to be void

TYPES OF CONTRACT

1. Lump sum contract
2. Item rate contract
3. Lump sum and schedule contract
4. Cost plus fixed fee contract
5. Cost plus percentage of cost contract
6. Special contracts

TYPES OF CONTRACT

1. LUMP SUM CONTRACT:
   - This is a single fixed price contract.
   - In this contract, contractor agrees to perform specified job for fixed sum.
   - The owner provides the contractor exact specification of the work.
   - In this contract both the parties try to fix the conditions of the work as precisely as possible.
   - ADVANTAGES:
     - Owner is aware of the cost of the project before the project construction starts.
     - It avoids a lot of details and accounting by both owner and contractor.
     - Contractor gets free hand to execute the work.
     - If this contract is used with design-construct method of delivery, contractor gets opportunity to use value engineering.

TYPES OF CONTRACT

1. LUMP SUM CONTRACT:
   - DISADVANTAGES:
     - It is very difficult to accommodate any charge in design and specification.
     - This contract is as good as the accuracy of the contract document. If errors exist in the contract document, the contract need to be renegotiated and hence more risk is involved from the owner ride.
     - In the case of unforeseen hazard during the construction, contractor may be put in adverse situation.
   - This is suited for small job, precisely specified job, low risk with construction job. This is generally suited for the job where it is easy to make the measurement. Lump-sum contract should be avoided for underground work.

     Lump-sum contract with design construct method of delivery is often called turn key contract

TYPES OF CONTRACT

2. ITEM RATE CONTRACT:
   - Also called a schedule contract, in this contract, the contractor undertakes the execution of work on an item rate basis.
   - The amount to be received by the contractor, depends upon the quantities of various items of work actually executed.
   - The payment to the contractor is made on the basis of detailed measurements of different items of work actually done by him.
   - The item rate contract is most commonly used for all types of engineering works financed by public or government bodies.

TYPES OF CONTRACT

2. ITEM RATE CONTRACT:

- ADVANTAGES:
  - In this type of contract, there is no need for detailed drawings at the time of allotting contract.
  - The detailed drawings can be prepared after the contract is awarded.
  - Changes in drawings and quantities of individual items can be made as per requirement within agreed limits.
  - The payment to the contractor is made on the actual work done by his at the agreed rates.
- DISADVANTAGES:
  - The total cost of work can only be known upon completion.
  - Additional staff is required to take detailed measurements of work done for releasing payments to the contractor.
  - The scope for additional saving with the use of interior quality materials may prompt the contractor to use such materials in the work.

TYPES OF CONTRACT

3. LUMP SUM AND SCHEDULE CONTRACT:
   - This is similar to the lumpsum contract except the schedule of rates is also included in the contract agreement.
   - In this type of contract, the contractor offers to do a particular work at a fixed sum within a specified time as per plans and detailed specifications.
   - The schedule of rates for various items is provided which regulates the extra amount to be paid or deducted for any additions or deletions made during the progress of work.

TYPES OF CONTRACT

3. LUMP SUM AND SCHEDULE CONTRACT:

- ADVANTAGES:
  - In this type of contract, additional staff for recording detailed measurements of original item of work is not required for making payment to the contractor.
  - The owner can know from tenders as to what the project will cost him. Knowing the financial implications, the owner can decide to start or defer the project.
- DISADVANTAGES:
  - Before the contract is awarded the project has to be studied thoroughly and all the contract documents are required to be completed in every respect.
  - The non-scheduled extra items arising out of changes made in the drawings and specifications are often a source of dispute because the contractor presses for rates higher than the prevailing market rates.

TYPES OF CONTRACT

4. COST PLUS FIXED FEE CONTRACT:

- Cost Plus fixed fee contract is desirable when the scope and nature of the work can atleast be broadly defined.
- The amount of fee is determined as a plump sum from a consideration of the scope of work, its approximate cost, nature of work, estimated time of construction, manpower and equipment requirements etc.
- The contractor in this type of contract is selected on the basis of merit rather than the fee alone.
- In case of cost plus percentage contract, the contractor has a tendency to increase his profit by increasing the cost of work. But this drawback is overcome in cost plus fixed fee contract because here the contractor's fee is fixed and does not fluctuate with actual cost of work. Once this fee is fixed, the contractor cannot increase the cost of work.

TYPES OF CONTRACT

4. COST PLUS FIXED FEE CONTRACT:

- ADVANTAGES:
  - In this type of contract, actual cost is to be borne by the owner. Therefore, the contractor performs the work in the best interest of the owner resulting in good quality work.
  - The work can be taken in hand even before the detailed drawings and specifications are finalised.
  - Changes in design and method of construction if needed can be easily carried out without disputes.
  - The work can be executed speedily.
- DISADVANTAGES:
  - This form of contract cannot be adopted normally in case of public bodies and Government departments.
  - The final cost of the work is not known in advance and this may subject the owner to financial difficulties.

TYPES OF CONTRACT

5. COST PLUS PERCENTAGE OF COST CONTRACT:
   - In this type of contract, instead of awarding the work on lumpsum or item rate basis, it is given on certain percentage over the actual cost of construction.
   - The actual cost of construction is reported by the contractor and is paid to him by the owner together with a certain percentage as agreed earlier.
   - The contractor agrees to do the work in accordance with the drawings, specifications and other conditions of contract.
   - In this type of contract, proper control has to be exercised by the owner in the purchase of materials and in arranging labour.

TYPES OF CONTRACT

6. SPECIAL CONTRACT:
   - Turn-key Contract
   - Package Contract
   - Negotiated Contract
   - Continuing Contract
   - Running Contract

TYPES OF CONTRACT

6. SPECIAL CONTRACT:

- Turn-key Contract
  - A turn-key contract is an integrated contract in which all works pertaining to various disciplines such as civil, electrical, mechanical etc. are in the hands of a single contractor called the main contractor.
- Package Contract
  - In a package contract, two or more related jobs, each of which could form a separate contract are combined in a single contract.
  - In the field of civil engineering, generally, design and development are combined with construction and supply or maintenance.
- Negotiated Contract
  - In this type of contract, negotiation across the table takes place between representatives of the owner and the main contractor for project cost and other conditions of contract.
  - In this type of contract, detailed projects specifications are arrived at by discussions between the owner and the main contractor and consultant.

TYPES OF CONTRACT

6. SPECIAL CONTRACT:

- Continuing Contract
  - In this type of contract, new or additional work is awarded to the contractor on the basis of agreed terms and conditions of an existing contract.
  - Such contracts do not require re-tendering and hence can save time and money.
- Running Contract
  - Such contracts provide goods and services at specified intervals or as and when required by the owner.
  - The contract price is not fixed and payment is based on goods supplied and services rendered as specified in the contract documents

101. For supply lime is measured in_____.

a) Bags of 50 kg

b) Cubic metre

c) Kilograms

d) Quintals

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a) Bags of 50 kg

b) Cubic metre

c) Kilograms

d) Quintals

102. What is the estimate (Rs) for a building with a plinth area of 2000 Sq.m with rate of Rs. 3800 per Sq.m? (consider the adds of 15% of electric installation and 7% of miscellaneous)

a) 150000
b) 450080
c) 2423000
d) 9272000

102. What is the estimate (Rs) for a building with a plinth area of 2000 Sq.m with rate of Rs. 3800 per Sq.m? (consider the adds of 15% of electric installation and 7% of miscellaneous)

a) 150000

b) 450080

c) 2423000

d) 9272000

$$Estimate = plinth\ area \times rate\ per\ sq\ m$$
$$Estimate = 2000 \times 3800$$
$$Estimate = 7600000$$
$$allowing\ 15\%\ electric\ installation\ and\ 7\%miscellaneous$$
$$Total\ Estimate = 7600000(1 + 0.15 + .07)$$
$$Estimate = 9272000$$

103. What is the quantity (Sq.m) of plastering required for the 6m length of wall which is 4m high and 50 cm thick?

a) 12
b) 24
c) 48
d) 56

103. What is the quantity (Sq.m) of plastering required for the 6m length of wall which is 4m high and 50 cm thick?

a) 12

b) 24

c) 48

d) 56

$$\textbf{Area of plastering} = 4 \times 6 = 24m^2$$

$$\textbf{Since plastering is done on both sides}$$

$$\textbf{Quantity of plastering reqd} = 2 \times 24 = 48m^2$$

104. Which of the following item is NOT a lump sum item?

a) Architectural features

b) Contigencies and unforeseen items

c) Electric installation

d) Plastering of wall

104. Which of the following item is NOT a lump sum item?

a) Architectural features

b) Contigencies and unforeseen items

c) Electric installation

d) Plastering of wall

105. Which of the following method is used to prepare the approximate estimate?

a) Cubical contents method

b) Plinth area method

c) Unit base method

d) All option are correct

105. Which of the following method is used to prepare the approximate estimate?

a) Cubical contents method

b) Plinth area method

c) Unit base method

d) All option are correct

106. Calculate the value of a pump after 5 years, if the annual depreciation value is Rs. 200. The original cost of pump is Rs. 3000 and useful life of the pump is 10 years.

a) 200
b) 1000
c) 1300
d) 2000

106. Calculate the value of a pump after 5 years, if the annual depreciation value is Rs. 200. The original cost of pump is Rs. 3000 and useful life of the pump is 10 years.

a) 200

b) 1000

c) 1300

d) 2000

$$depreciation\ after\ 5years = 5 \times annual\ depreciation$$
$$depreciation\ after\ 5years = 5 \times 200 = 1000$$

$$Value\ of\ pump = original\ cost - depreciated\ value$$
$$Value\ of\ pump = 3000 - 1000 = 2000$$

107. Which of the following estimate is carried out if the sanctioned estimate exceeds 5% due to change in the price?

a) Detailed estimate
b) Plinth area estimate
c) Preliminary estimate
d) Revised estimate

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a) Detailed estimate

b) Plinth area estimate

c) Preliminary estimate

d) Revised estimate

108. For estimation of masonary work and excavation work accuracy requirement in the measurement of length as compared to thickness or width is_____.

a) Less
b) More
c) Equal
d) Independent

108. For estimation of masonary work and excavation work accuracy requirement in the measurement of length as compared to thickness or width is_____.

a) Less

b) More

c) Equal

d) Independent

109. A wall of width 300mm contains two T-junctions. The height of wall is 3m and total length of the central line is 150m. Calculate the quantity of the brick work (in cubic meter) using central line method.

a) 134.46
b) 134.73
c) 134.86
d) 135

109. A wall of width 300mm contains two T-junctions. The height of wall is 3m and total length of the central line is 150m. Calculate the quantity of the brick work (in cubic meter) using central line method.

a) 134.46

b) 134.73

c) 134.86

d) 135

$$\textbf{quantity of the brick work} = (150 - 0.3) \times 0.3 \times 3 \ = 134.73m^3$$

110. Which of the following is not measured in cubic meter?

a) Brick work

b) Concrete work

c) Excavation work

d) Plinth

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a) Brick work

b) Concrete work

c) Excavation work

d) Plinth

111. For estimation of the brick masonry, no deduction is made for the end of the rafter up to the area (square inch) of

a) 50
b) 72
c) 180
d) 44

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a) 50

b) 72

c) 180

d) 44

112. Calculate the quantity (cubic meter) of the concrete used in a pier of 1.2m diameter and 6m length. The pier is rainforced with 8 bars of 256 mm diameter.

a) 6.5
b) 6.78
c) 8.64
d) 9.3

112. Calculate the quantity (cubic meter) of the concrete used in a pier of 1.2m diameter and 6m length. The pier is rainforced with 8 bars of 256 mm diameter.

a) 6.5

b) 6.76

c) 8.64

d) 9.3

$$Volume\ of\ pier = \frac{\pi}{4} d^2 \times L$$

$$= \frac{\pi}{4} \times (1.2^2) \times 6$$

$$= 6.7\ m^3$$

$$Volume\ of\ concrete\ = volume\ of\ pier - Volume\ of\ reinforcement$$

$$Volume\ of\ concrete\ = 6.7 - \frac{\pi}{4} \times (0.025^2) \times 6$$

113. In long wall and short wall method, the length of the short wall is the equal to the centre to centre length of wall minus_____.

a) Half of the width of wall
b) One fourth of width of wall
c) Twice of the width of wall
d) Width of wall

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a) Half of the width of wall

b) One fourth of width of wall

c) Twice of the width of wall

d) Width of wall

114. Calculate the quantity (cubic meter) of the earthwork for a canal of 50m long. Depths of canal at two extreme sections are 3m and 5m. the bottom width and top width of the canal are 2m and 4m. Use mid section method.

a) 450
b) 600
c) 750
d) 900

114. Calculate the quantity (cubic meter) of the earthwork for a canal of 50m long. Depths of canal at two extreme sections are 3m and 5m. the bottom width and top width of the canal are 2m and 4m. Use mid section method.

a) 450

b) 600

c) 750

d) 900

115. Which of the following is NOT included in the floor area?

1. Clear coverage area
2. Area of the walls
3. Sills of the doors
4. Sills of the windows

Options

a) 1 and 3
b) 2 and 3
c) 2, 3 and 4
d) 2 and 4

115. Which of the following is NOT included in the floor area?

1. Clear coverage area
2. Area of the walls
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4. Sills of the windows

Options

a) 1 and 3

b) 2 and 3

c) 2, 3 and 4

d) 2 and 4

116. Which of the following method is used for estimation of depreciation of building?

a) Constant percentage method

b) Direct comparison method

c) Longistic curve method

d) Rental method

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a) Constant percentage method

b) Direct comparison method

c) Longistic curve method

d) Rental method

117. Capitalized value of property is the product of

a) Annual income and annuity

b) Annual income and interest

c) Annual income and sinking fund

d) Annual income and years purchase

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a) Annual income and annuity

b) Annual income and interest

c) Annual income and sinking fund

d) Annual income and years purchase

118. Calculate the total quantity (cubic meter) of the coarse aggregate required for an isolated rectangular footing of size 3m × 2m, if 1:2:4 cement, concrete is used. The depth of the footing is 600mm.

a) 2.05
b) 2.46
c) 3.16
d) 3.82

118. Calculate the total quantity (cubic meter) of the coarse aggregate required for an isolated rectangular footing of size 3m × 2m, if 1:2:4 cement, concrete is used. The depth of the footing is 600mm.

a) 2.05

b) 2.46

c) 3.16

d) 3.82

119. Which of the following is the correct statement for length of the long wall as one move from earthwork to brick work in super structure in long and short wall method?

a) Its value decreases

b) Its value depends upon the length of wall

c) Its value increases

d) Its value remains same

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a) Its value decreases

b) Its value depends upon the length of wall

c) Its value increases

d) Its value remains same

120. Calculate an approximate estimate (Rs.) of the building with total plinth area of the building is 500 square meters. The rate of the plinth area is Rs. 3000 per square meters. The costs of the water supply and contingencies are 7% and 5% of cost of construction respectively.

a) 1500000
b) 1650000
c) 1680000
d) 1870000

120. Calculate an approximate estimate (Rs.) of the building with total plinth area of the building is 500 square meters. The rate of the plinth area is Rs. 3000 per square meters. The costs of the water supply and contingencies are 7% and 5% of cost of construction respectively.

a) 1500000

b) 1650000

c) 1680000

d) 1870000

121. Calculate the cost of the plastering required for a wall of 4m long, 3.5m high and 300mm thick, if the rate plastering is Rs. 12 per. Square meter.

a) 101
b) 168
c) 336
d) 423

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a) 101
b) 168
c) 336
d) 423

122. Which of the following is the unit of measurement of the sills of windows?

a) Cubic meter

b) Meter

c) Number

d) Square meter

122. Which of the following is the unit of measurement of the sills of windows?

a) Cubic meter

b) Meter

c) Number

d) Square meter

123. Which of the following area is included in the plinth area of the building?

a) Area of the lofts

b) Area of barsati at terrace level

c) Cornices

d) Tower projecting above terrace level

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a) Area of the lofts

b) Area of barsati at terrace level

c) Cornices

d) Tower projecting above terrace level

124. Calculate the capitalized value of building having annual rent of Rs. 20000 and highest rate of interest is 5%

a) 1000
b) 21000
c) 220000
d) 400000

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a) 1000

b) 21000

c) 220000

d) 400000

125. Accuracy in the measurement of the volume in cubic meter should be near to _____.

a) 0.001

b) 0.01

c) 0.02

d) 0.1

125. Accuracy in the measurement of the volume in cubic meter should be near to _____.

a) 0.001

b) 0.01

c) 0.02

d) 0.1

126. Deduction for total length of the central line at the corner where two walls meet is___.

a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

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a) Half of thickness of wall

b) No deduction

c) Thickness of wall

d) Twice of the thickness of wall

127. Which of the following is estimated by using a bending schedule?

a) Brick work

b) Concrete work

c) Earth work

d) Steel work

127. Which of the following is estimated by using a bending schedule?

a) Brick work

b) Concrete work

c) Earth work

d) Steel work

128. Which of the following is measured in square meter?

a) Cornice

b) Concrete work

c) Shuttering

d) Steel reinforcement bar

128. Which of the following is measured in square meter?

a) Cornice

b) Concrete work

c) Shuttering

d) Steel reinforcement bar

129. Which of the following statement are the CORRECT for estimation of plastering?

1. For opening upto 0.5 square meters, no deduction is made.
2. For opening exceeding 0.5 square meters and upto 3 square meters, deduction is made for one faces.
3. For opening upto 3 square meters, deduction is made for both faces.
4. For ends of beams, no deduction is made.

Options

a) 1 and 4
b) 1, 2 and 4
c) 1, 3 and 4
d) 3 and 4

129. Which of the following statement are the CORRECT for estimation of plastering?

1. For opening upto 0.5 square meters, no deduction is made.
2. For opening exceeding 0.5 square meters and upto 3 square meters, deduction is made for one faces.
3. For opening upto 3 square meters, deduction is made for both faces.
4. For ends of beams, no deduction is made.

Options

a) 1 and 4

b) 1, 2 and 4

c) 1, 3 and 4

d) 3 and 4

130. Chowkhat or frame of the door is measured in

a) Cubic meter

b) Meter

c) Quintal

d) Square meter

130. Chowkhat or frame of the door is measured in

a) Cubic meter

b) Meter

c) Quintal

d) Square meter

131. Calculate the preliminary estimate for a building having a total carpet area of 500 square meters. Extra provision as 10% of the carpet area is provided for walls and verandah. The plinth area rate is Rs. 1200 per Sq. Meter.

a) 60000
b) 540000
c) 600000
d) 660000

131. Calculate the preliminary estimate for a building having a total carpet area of 500 square meters. Extra provision as 10% of the carpet area is provided for walls and verandah. The plinth area rate is Rs. 1200 per Sq. Meter.

a) 60000
b) 540000
c) 600000
d) 660000

132. Calculate the quantity of the sand required for 8 cubic meter brick work with cement mortar (1:3)

a) 1.38

b) 1.5

c) 1.8

d) 2.4

132. Calculate the quantity of the sand required for 8 cubic meter brick work with cement mortar (1:3)

a) 1.38

b) 1.5

c) 1.8

d) 2.4

133. Which of the following is the multiplying factor for the estimation of lead for sandy tracks?

a) 1
b) 1.1
c) 1.2
d) 1.4

133. Which of the following is the multiplying factor for the estimation of lead for sandy tracks?

a) 1

b) 1.1

c) 1.2

d) 1.4

134. The expected out turn (square metre) of sawing of the soft wood per mason per day is

a) 2.5
b) 5.5
c) 8.5
d) 10

134. The expected out turn (square metre) of sawing of the soft wood per mason per day is

a) 2.5

b) 5.5

c) 8.5

d) 10

135. In the straight line method the expression for depreciation of a machine having purchasing cost C, scrap value S and useful life of the machinery n, is_____.

a) (C +S)/n

b) (C – S)/n

c) [1 –(C/S)] ×n

d) [1 –(C/S)] ×n

135. In the straight line method the expression for depreciation of a machine having purchasing cost C, scrap value S and useful life of the machinery n, is_____.

a) (C +S)/n

b) (C – S)/n

c) [1 –(C/S)] ×n

d) [1 –(C/S)] ×n

136. Grouting of the cracks is measured in_____.

a) Cubic metre

b) Metre

c) Number

d) Square metre

136. Grouting of the cracks is measured in_____.

a) Cubic metre

b) Metre

c) Number

d) Square metre

137. Which of the following is NOT measured in square metre?

a) Drip course

b) Pointing

c) Shuttering

d) Damp proof course

137. Which of the following is NOT measured in square metre?

a) Drip course

b) Pointing

c) Shuttering

d) Damp proof course

138. Calculate the approximate estimate of a four storey building, if the total plinth area is 300 square metres per floor and height of floor is 3m. The cubical content rate is Rs. 2000 per cubic metre and profit of contractor is 10% of the total cost.

a) 2400000
b) 2640000
c) 7200000
d) 7920000

138. Calculate the approximate estimate of a four storey building, if the total plinth area is 300 square metres per floor and height of floor is 3m. The cubical content rate is Rs. 2000 per cubic metre and profit of contractor is 10% of the total cost.

a) 2400000
b) 2640000
c) 7200000
d) 7920000

139. Calculate the quantity (cubic meter) of brick work for a room using the central line method, if the interior dimension of the room is 5m × 5m and height of the room is 3.5m. The width of the wall is 300mm and dimension of the door is 2m × 1.2m.

a) 19.2
b) 19.44
c) 20.16
d) 20.88

139. Calculate the quantity (cubic meter) of brick work for a room using the central line method, if the interior dimension of the room is 5m × 5m and height of the room is 3.5m. The width of the wall is 300mm and dimension of the door is 2m × 1.2m.

a) 19.2

b) 19.44

c) 20.16

d) 20.88

140. Calculate the number of bags of cement required for the 12mm thick plastering of a wall of 5m long, 3.5m high and 300mm thick, if 1:3 cement mortar is used

a) 3
b) 4
c) 5
d) 6

140. Calculate the number of bags of cement required for the 12mm thick plastering of a wall of 5m long, 3.5m high and 300mm thick, if 1:3 cement mortar is used

a) 3

b) 4

c) 5

d) 6

141. Which one of the following shows total quantities of all the items of materials required for the completion of the construction?

a) Bar bending schedule

b) Material statement

c) Sundries

d) Work charged establishment

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a) Bar bending schedule

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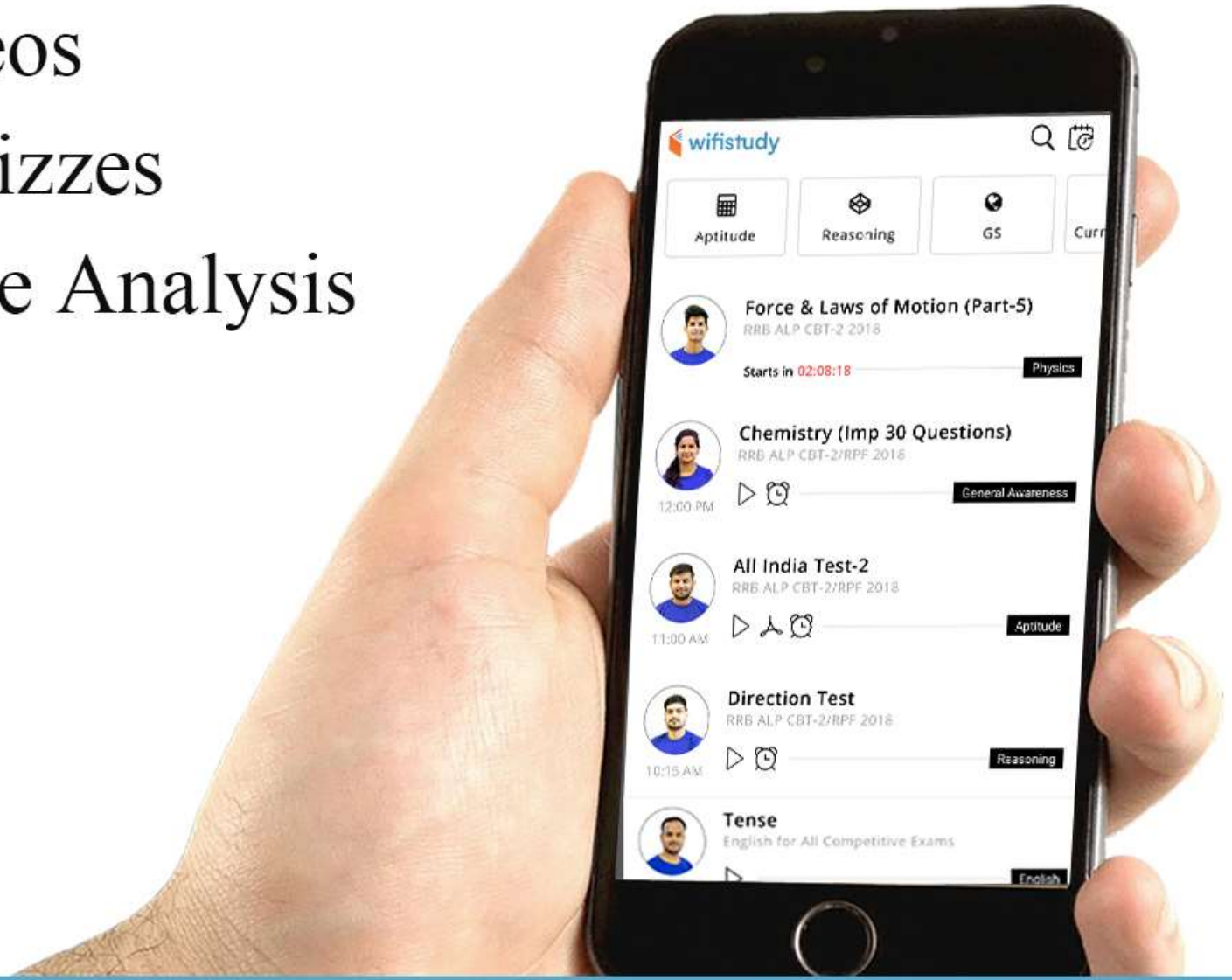

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