TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
# Examination Control Division
**2080 Baishakh**

| Exam. | Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject*: - Estimating and Costing (*CE 705*)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*



1. What is estimating and costing? Explain the principle of units. [2+3]
2. What are the various methods of taking out quantities? What are the sub-heads of items of work for building project? [4+4]
3. Why and when are these estimates prepared/used? [2×2]
   a) Preliminary estimate
   b) Complete estimate
4. Prepare the analysis of rate for 12.5 mm plastering work in 1:3 cement sand mortar per 100 square meters all complete and as per the instruction of engineer. What modification is required in the given calculation if the plaster work is for ceiling work? Also, justify why lead and lift is important for the analysis of rate work. [6+1+1]
5. Prepare an analysis of rate for providing and fixing wash basin of size (800×400) per number. [8]
6. Describe different stages of project estimate. Explain the characteristic of technical report writing of a project. [4+4]
7. Prepare detailed estimate of the following items of works from the given building drawing attached fig 3. [3+2+4+3]
   a) Earth work in excavation in foundation
   b) Plain cement concrete (1:3:6) in foundation.
   c) Brickwork in 1:6 C.S. in super structure wall.
   d) Wood work for door and window frame.
8. Calculate the quantity of earthwork and area of permanent land required for the land acquisition purpose for a portion of a channel from following data: [12]

   Bed width = 4m
   Free board = 45 cm
   Side slope in cutting = 1:1
   Side slope in banking = 1.5:1
   Full supply depth = 1 m
   Top width of bank = 3 m left and 1.5 m right

| Chainage | 90 | 120 | 150 | 180 | 210 | 220 |
|---|---|---|---|---|---|---|
| RL Ground | 109.8 | 109.7 | 109.55 | 109.30 | 109.15 | 109.10 |
| RL Bed | 109.52 | Bed slope 1:300 rising | | | | |

9. Prepare a detailed estimate of the following items from the septic tank with soak pit from the given fig 1. [4+2+2]

a) Earth work in excavation for soak pit
b) Cement concrete flooring for septic tank
c) Cement plaster (1:3) of 20 mm for septic tank floor

Dimensions of septic tank is: width = 750 mm, length = 1500 mm
Soak pit is of 1000 mm diameter

10. From the given fig 2 of RCC T-beam decking of one span of 6 m of which section in given, calculate the following items of works. [4+3]

a) PCC for RCC work
b) Reinforcement quantities for all RCC member

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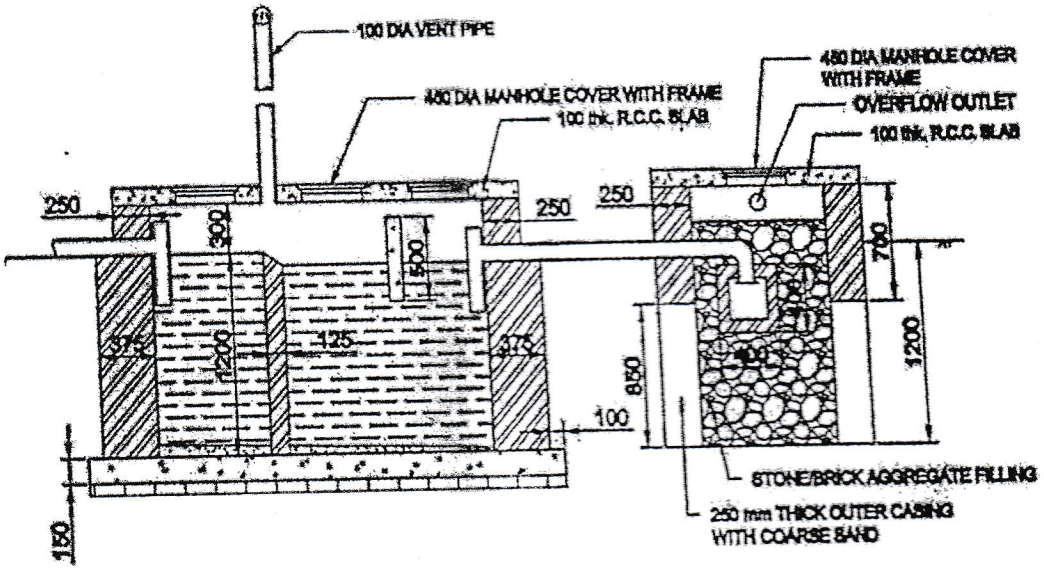



Fig 1

R. C. C. T-BEAM DECKING

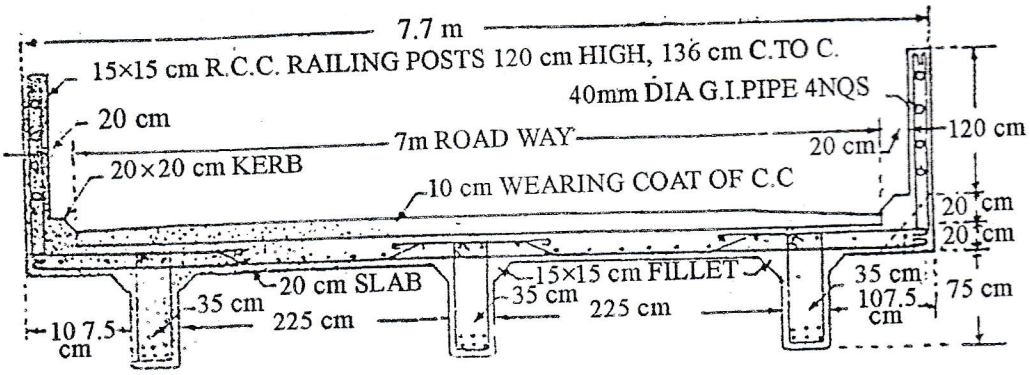
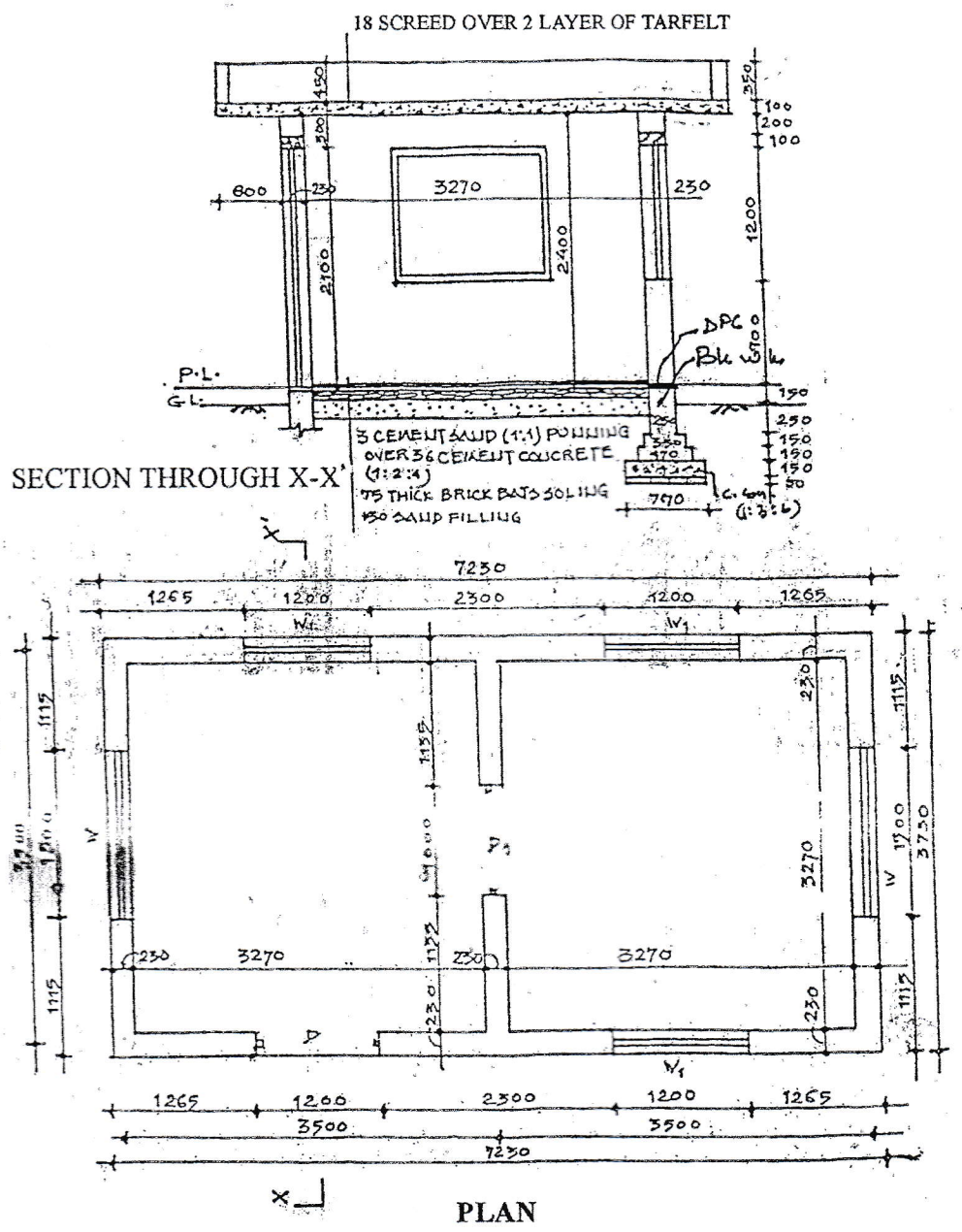



Fig 2




DOORS AND WINDOWS SCHEDOLE

All dimensions are in mm.

D = 1200×2100

$D_1$-1000×2100

W – 15400×1200

$W_1$-1200×1200

Fig 3

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INSTITUTE OF ENGINEERING
**Examination Control Division**
**2079 Bhadra**

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***Subject:*** - Estimating and Costing (*CE 705*)

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1. You are working for a design project of a building. Your Team Leader instruct you to perform a work break down structure for the quantity calculation work. How are you planning to do so for the frame structure building project? [4]
2. What are the necessary points that needs to be considered while measuring earthwork. In what case do you need to prepare revise estimate? Explain with an example. [4+4]
3. Prepare a preliminary estimate of a building having a total carpet area of 2000 $m^2$ for obtaining the administrative approval of the ministry. Given the following data: [6]
   - 30% built up area will be taken up by circulation space
   - 10% built up area is occupied by walls
   - Plinth area rate is Rs 20000.00 /sqm
   - Interior design will taken 1% of the building cost
   - Other extra services will cost 5% of the building cost
   - Take supervision charge as 3%
4. Why analysis of rate is important for civil engineering work. Also, explain how rates are taken for analysis. Calculate the quantities of materials required for PCC (1:1.5:3) for RCC roof 0.10 m thick 20 m wide and 25 m long [Assuming rebar 0.8% to vol. of PCC] [2+2+4]
5. Prepare analysis of rates for providing, laying and consolidation of 30 cm thick compacted gravel for sub grade per square meter. [8]
6. What are the requisites for a project estimate? Explain in brief the factors you consider while preparing a building project estimate. [4+4]
7. Find following quantities for following item of works from attached building drawing. The building is a load bearing structure with 23 cm wall all around. a non-load bearing wall of thickness 11 cm divides the living room and the bathroom. The half brick thick wall is not connected to the foundation. [3+4+3]
   a) Earthwork in excavation in foundation
   b) First class brick work in cement sand mortar (1:4) in super structure.
   c) 12 mm thick cement plaster in 1:4 c/s mortar in inner (opening schedule door: 2 nos 1.2×2.1 m, window 3 nos 1×1.1 m)
8. Briefly explain the method of quantity estimate for road construction. Workout the quantities of earthwork in embankment and cutting based on the data provided below.

   Formation width of road: Dedicated four lane width based on NRS-1070. Side slope in embankment and excavation is 1:2 and 1:1.5 respectively. [2+10]

| Chainage | 0+000 | 0+030 | 0+060 | 0+090 | 0+120 | 0+150 | 0+180 |
|---|---|---|---|---|---|---|---|
| RL of GL (m) | 152.00 | 152.35 | 152.60 | 152.80 | 153.00 | 152.65 | 152.20 |
| RL of FL (m) | | | | 151.80<br>152.45 | | | 153 |
| Cross slope | Plain | Plain | 1:12 | 1:10 | 1:11 | 1:11 | 1:13 |
| Gradient of road | 1:200 rising | | | | 1:300 rising | | |

9. The plan and section of the under-ground water tank which is fully constructed below the ground level. Find the quantities of [2+4+2]

   a) Earthwork in excavation for construction.
   b) Brickwork in 1:6 cement sand mortar.
   c) Plastering work for inner part of tank.

10. Work out quantity of well foundation for bridge. The well is to be circular of 2 m internal diameter with 300 mm thick masonry wall in 1:6 cement sand mortar. The well is founded in strata 14.00 m thick. Water table remains at 3.80 m depth. Well curb at bottom is RCC with M25 grade concrete mix and is 400 mm deep. The well rises 60 cm above ground level. Top of well is to sealed with 0.45 m thick (1:4:8) cement concrete as well cover estimate quantities for the following works. [4×2]

   a) Sinking of well.
   b) Brick masonry work in (1:6) cement sand mortar.
   c) Sand filling.
   d) PCC for RCC in well cover.

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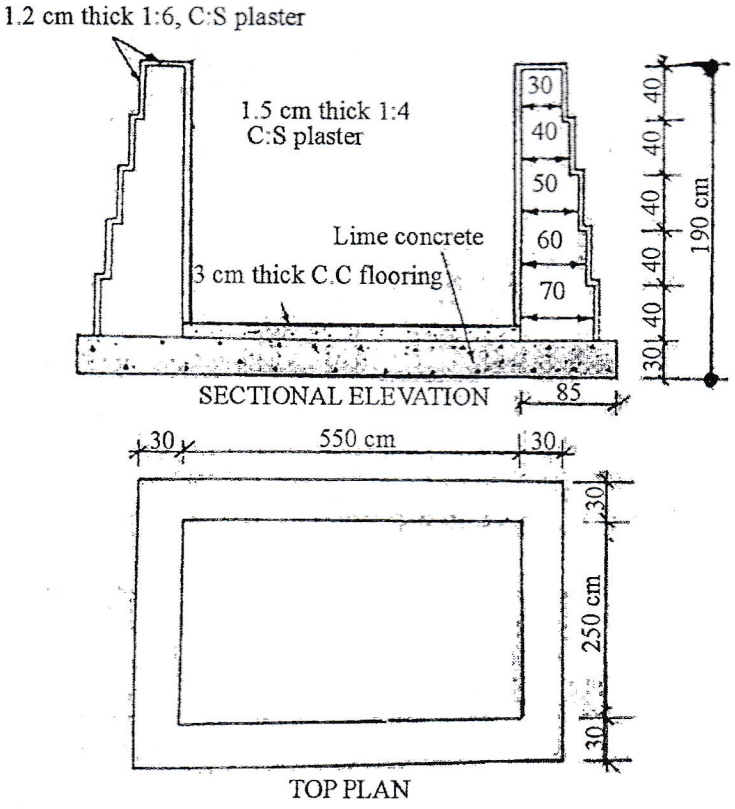


Fig: Underground Water tank

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**Examination Control Division**
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1. Explain that estimated cost is never the actual cost. What are the data required for estimating? [3+2]
2. What are the various methods of taking out quantities of civil engineering? Explain briefly. State the different factors considered during detailed estimation. [4+2]
3. Prepare a preliminary estimate of the four storied office building having carpet area of $250m^2$ per story. The height of each story is 3.5m and on the roof floor there is parapet wall of 0.90m height. The cube rate of the building in that locality is Rs. 250/cu.m. Take 10% built up area is covered by walls and 35% by circulation purposes. Assume other necessary suitable provisions. [5]
4. What are the requirements for rate analysis? Explain the factors affecting the rate analysis. [4+4]
5. Prepare an analysis of rate for sal wood doors and windows frame per $m^3$. [4]
6. Prepare the analysis of rates one metric ton of reinforcement. Labor norms per MT skilled 12 no/$m^3$/day, unskilled 12 no/$m^3$/day. Assume suitable rates. [6]
7. What are the tasks you need to consider in preparing estimate of a building project work? Explain in brief. Discuss estimation irrigation project. [4+4]
8. Prepare detailed estimate of the item of work form the building drawing (figure 1) attached herewith: [4×5]
   a) Earthwork in excavation in foundation
   b) PCC (1:3:6) in foundation
   c) Brick work in 1:6 cement sand mortar upto Plinth
   d) Plastering work 1:4 for the ceiling.
9. Calculate the quantity of earthwork and area of permanent land required for the land acquisition purpose for a portion of a channel form following data: [10]
   Bed width = 4m
   Free board = 45cm
   Side slope in cutting = 1:1
   Side slope in banking = 1.5:1
   Full Supply depth = 1m
   Top width of bank = 3m left and 1.5m right
   There is 50cm fall at chainage 800m

| Chainage | 800 | 850 | 900 | 950 | 1000 | 1050 |
|---|---|---|---|---|---|---|
| RL ground | 109.8 | 109.7 | 109.55 | 109.30 | 109.25 | 109.15 |
| RL Bed | 109.52 | Bed slope 1:250 | | | | |

10. From the attached drawing (figure 2) attached of RCC column, estimate the following items. [3+5]
    (i) RCC 1:2:4 in column
    (ii) Steel reinforcement work excluding formwork

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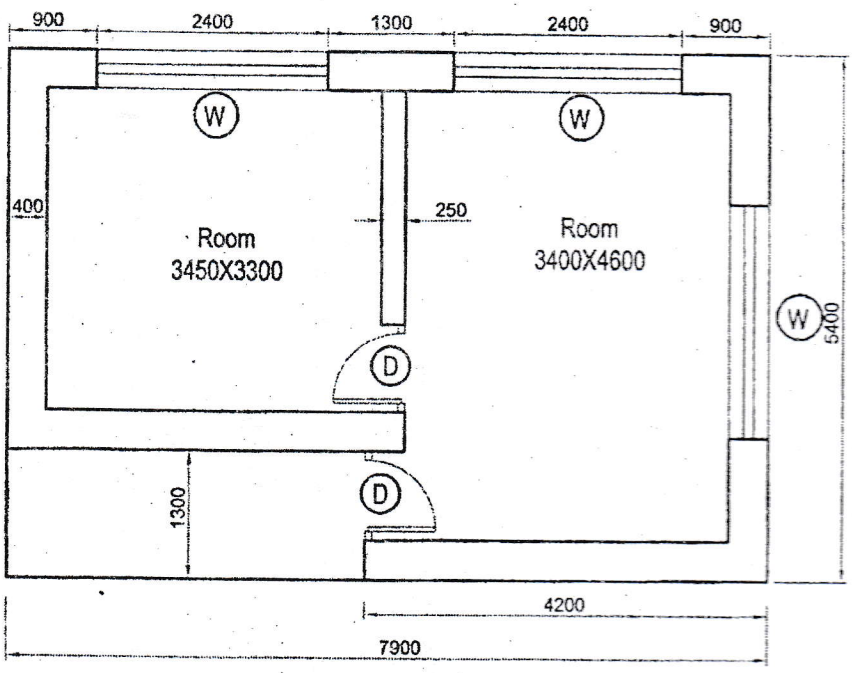
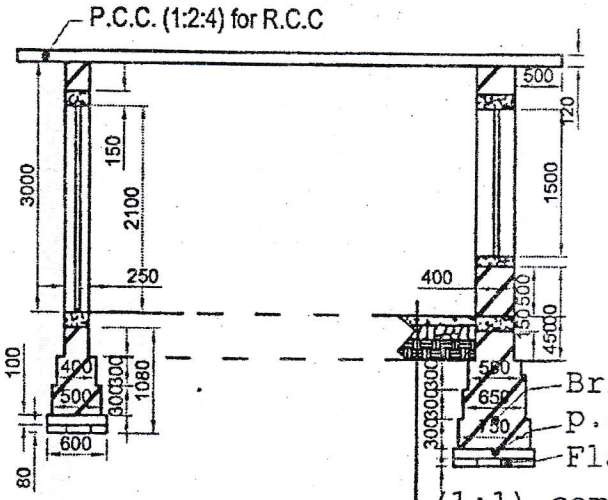
All dimensions are in mm




PLAN




**OPENINGS**

**D** = 900X2100

**W** = 2400X1500

SECTION OF 0.25m, WALL

SECTION OF 0.40m, WALL

Fig-1

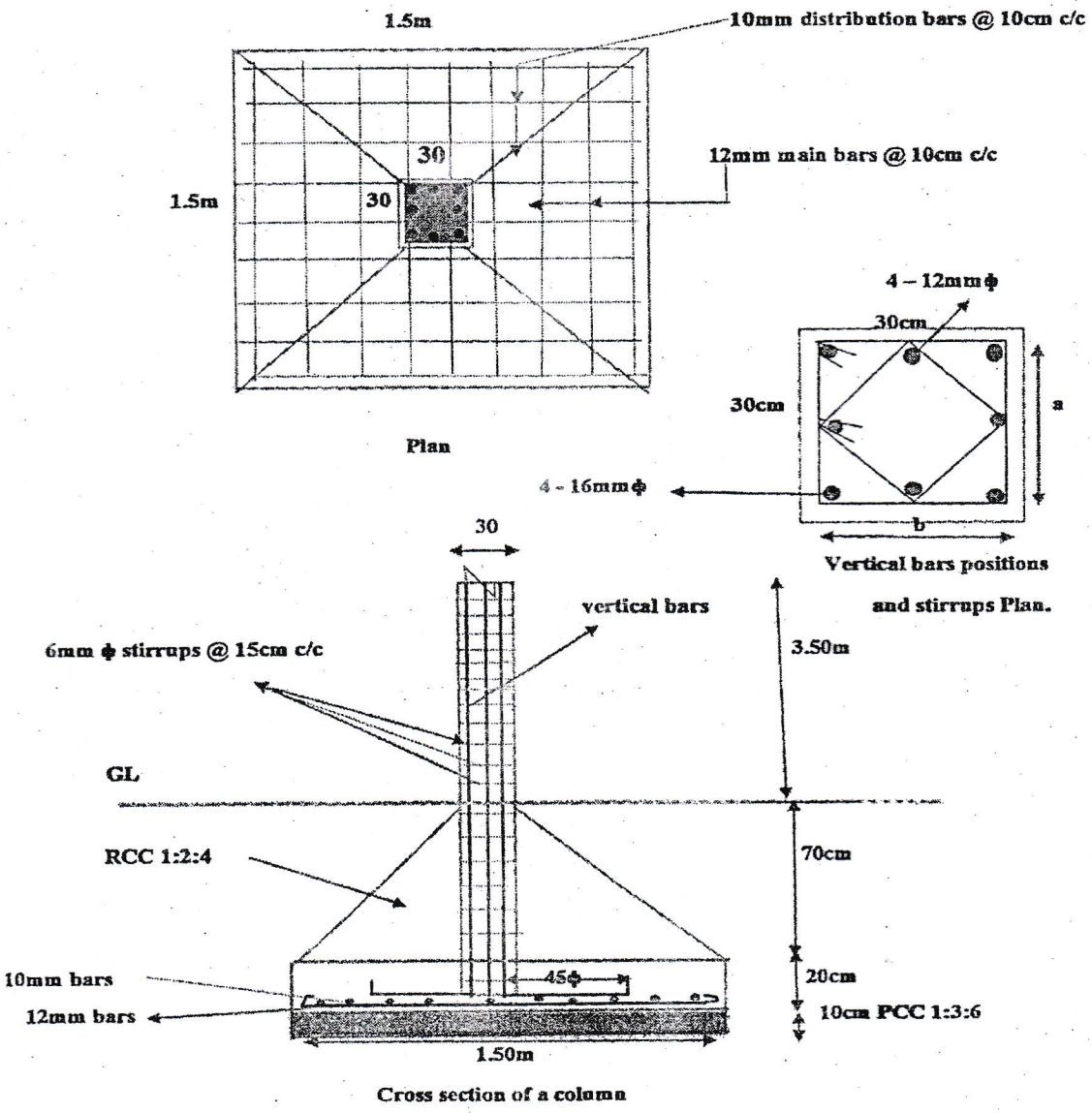

1.5m
10mm distribution bars @ 10cm c/c
30
30
1.5m
12mm main bars @ 10cm c/c
Plan
4 – 12mmϕ
30cm
30cm
a
b
4 - 16mmϕ
Vertical bars positions and stirrups Plan.
30
vertical bars
6mm ϕ stirrups @ 15cm c/c
3.50m
GL
RCC 1:2:4
70cm
45ϕ
10mm bars
12mm bars
20cm
10cm PCC 1:3:6
1.50m
Cross section of a column

Figure 2

TRIBHUVAN UNIVERSITY
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**Examination Control Division**
**2076 Chaitra**

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|---|---|---|---|
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| **Programme** | BCE | **Pass Marks** | 32 |
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## *Subject:* - Estimating and Costing *(CE 705)*

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1. a) List out principle of units of measurement. Explain the data required for preparing detailed estimate. [3]

   b) Mention the various purposes of estimating and costing. [3]

2. Explain the following: [2×3]
   a) Multiplying factors adopted of Panelled door and Louver door.
   b) Rules for deductions from plastering for opening brick surfaces.
   c) Bill of quantities and abstract of cost.

3. a) What do you understand by approximate estimate? When do you need revised estimate? [4]

   b) Prepare a preliminary estimate of six storied framed structure office building having a total carpet area 3000.00 $m^2$
   (i) Area for circulation is 20% of plinth area.
   (ii) Area for wall and column is 10% of plinth area.
   (iii)Prevailing plinth area rate per $m^2$ is Rs. 25000.00
   (iv)Extra cost for other services 25% of the cost of building. [4]

4. a) What are the requirements of preparing rate analysis? Explain the factors that affect rate analysis. [4]

   b) Calculate the quantities of materials required for following items of work. [6]
   (i) 115$m^2$ of 75mm thick PCC (1:3:6) in floor.
   (ii) 110$m^2$ fo 12.5mm thick cement sand plaster (1:4) in wall.

   c) Prepare an analysis of rate for brick work in (1:6) cement mortar in upper floor per $m^3$. [6]

   Or,

   Prepare an analysis of rate for W.C. Commode with cistern per set.

5. What is Project? How is building project estimate. [6]

6. Estimate quantities of earthwork of a portion of road from the following data: [10]
   (i) Formation width of road is 10m.
   (ii) Side slope in cutting and filling (1:1) and (2:1) (H:V) respectively.

| Distance | 0 | 30 | 60 | 90 | 120 | 150 | 180 |
|---|---|---|---|---|---|---|---|
| R.L. of ground | 102.60 | 103.00 | 102.65 | 102.20 | 101.50 | 101.20 | 100.65 |
| R.L. of formation | 101 | | | | 102.15 | | |
| Gradient | Rising Gradient 1 in 200 | | | | Falling Gradient 1 in 120 | | |

7. Workout the quantity of a portion of channel fully in banking with the following data: [10]

| Distance | R. L. of Ground level | Proposed bed level |
|---|---|---|
| 500 | 1314.75 | 1316.00 |
| 1000 | 1314.90 | |
| 1500 | 1314.20 | |

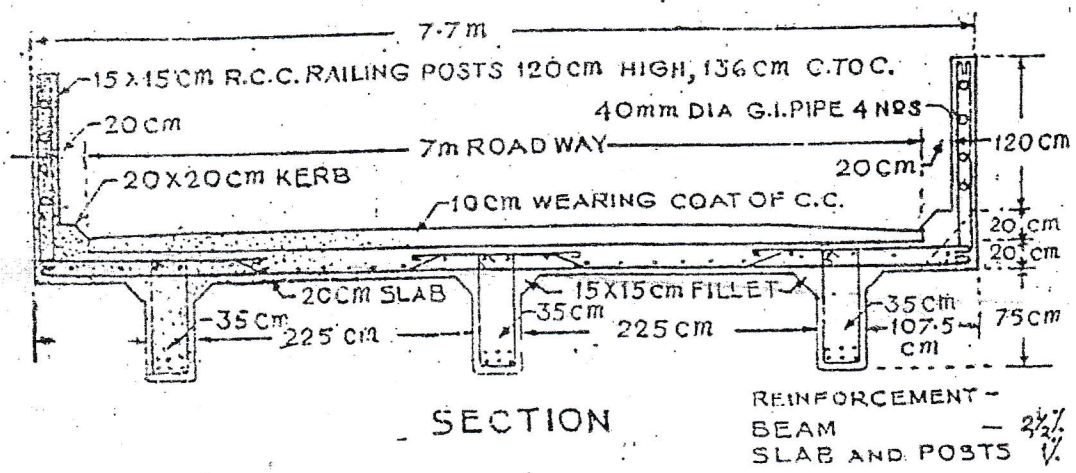
The bed width of channel is 4.50m. The bed slope is 1 in 5000. The full supply depth is 1.50m. and free board is 0.50m. The top width of both side banks are 2.50m in each bank. The side slope of banks is (1.5:1)

8. Estimate the quantities of the following items of work from the accompanying drawing (building):(Figure 1) [3+3+4]

(i) Earthwork excavation in foundation
(ii) wood work for doors and windows frame
(iii)Two coats enamel painting over one coat primer in doors and windows.

9. Estimate the quantities of a T-beam decking of single span bridge which has 6m clear span and bearing on either side is 45cm. from the accompanying bridge drawing. [8]

R. C. C. T-BEAM DECKING

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TRIBHUVAN UNIVERSITY
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1. What is an estimating? What are the purposes of estimating? Mention various data which are required for preparing detailed estimate. [1+3+2]
2. Explain the following: [2+2+2]
   a) Multiplying factors adopted in painting of Panelled door, flush door, Louver door and Glazed window.
   b) Rules for deductions from plastering for opening in brick surfaces
   c) Bill of quantities
3. a) When and where are the following estimates used: [6+5]
   (i) Detailed estimate (ii) Revised estimate (iii) Supplementary estimate
   b) Prepare a preliminary estimate of a five storied office building having total carpet area of 2500 $m^2$ for obtaining the administrative approval of the government, given the following data:
   (i) 30% of the built-up area will be taken up by corridors, verandah, staircase, lift etc and 10% of the built up area will be occupied by walls.
   (ii) Prevailing plinth area rate Rs. 25000.00 per $m^2$
   (iii)Provide 20% extra cost for water supply and sanitary fittings, electrical works, contingencies and other services.
4. a) What is an analysis of rate? Mention various factors on which the unit rates of particular item of work depends and also mention the various purposes of rate analysis. [5+6+6]
   b) Calculate the quantities of materials required for 100m long 23cm thick and 1.20m high wall in (1:6) cement mortar.(Assume size of brick is 235×110×57mm and thickness of mortar 10mm)
   c) Prepare an analysis of rate for 40mm thick PCC (1:2:4) in floor per $m^2$.
5. A road is to be constructed in hilly area with formation width of 10m, side slopes in banking and cutting (2:1) and (1:1). The height of banking or depth of cutting at the centre line of the road are given below. The cross slopes of ground are also given at different sections. Calculate the quantities of earthwork. [9]

| Distance | Cutting | Filling | Cross slope of ground |
|---|---|---|---|
| 0 | 0.50 | -- | 12:1 |
| 50 | 0.60 | -- | 10:1 |
| 100 | -- | 0.40 | 15:1 |
| 150 | -- | 0.60 | 12:1 |

6. Calculate the quantity of earthwork of an irrigation channel with the following data: [9]
   Bed width of channel = 5m
   Top width of both banks = 2m
   Longitudinal slope of bed = 1 in 3000
   Side slopes in cutting and filling = $1\frac{1}{2}$:1 (H:V)
   Fully supply depth = 1m
   Free board = 0.60m
   R.L. of bed at 0m = 1395.50m
   Ground level along the alignment are as given below:

| R.L. of Ground | 1397.50 | 1397.00 | 1396.50 | 1395.70 |
|---|---|---|---|---|
| Distance | 0 | 300 | 600 | 900 |

7. Estimate the quantities of the following items of work from the accompanying building drawings: [12]
   a) Earthwork in excavation in foundation
   b) Brick work in 2nd footing in foundation
   c) Wood work for doors and windows frame
8. Estimate the quantities of the following items of work from the accompanying RCC Slab Culvert drawings: [10]
   a) Earthwork in excavation in foundation
   b) PCC (1:3:6) in foundation
   c) PCC (1:2:4) for RCC slab

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1. State, why estimated cost is necessary in construction work. Describe various data required to prepare an estimate. [3+3]
2. What do you mean by contingencies and work charged establishment. Enumerate the relationship and differences between the Bill of quantities and Abstract of Estimated cost. [2+4]
3. The plinth area of an apartment is 500 Sq.m. determine the total cost of building from the following data: [4]
   i) Rate of construction = Rs. 3450 per $m^3$
   ii) The height of apartment = 16.25m
   iii) Water supply, sanitary and electrical installations each at 6% of building cost
   iv) Architectural appearance @ 1% of building cost
   v) Unforeseen item @ 2% of building cost
   vi) P.S and contingencies @ 4% of building cost
4. Explain the significance of analysis of rates in civil engineering projects. What are the requirements for analysis of rates? [3+3]
5. Calculate the quantities of material required for 10 $m^3$ brick masonry in (1:3) cement sand mortar. (normal size of brick = 9 "× 4½" × 3") [5]
6. Prepare analysis of rate for 25mm thick 1:2:4 for cement concrete floor 100 $m^2$. (Assume suitable rate) [5]
7. Define project. Discuss estimate of irrigation project. [6]
8. Calculate the quantity of earthwork of an irrigation canal with the following data.
   Bedwidth = 5m, freeboard = 0.6 m, fully supply depth = 1m,
   Trap width of both the bank =2m, Side slope in cutting =1:1, side slope in banking=1 ½:1 [6]

| Distance (m) | 0 | 300 | 600 m |
|---|---|---|---|
| Ground level (m) | 325.24 | 324.80 | 324.43 |
| Proposed bed level (m) | 324.00 | 1 in 3000 downward | |

9. Prepare detailed estimate of the following items of work for a building from the attached Fig.1. [4×3]
   i) Earthwork in excavation in foundation
   ii) First class brick work in (1:4) cement mortar in foundation and plinth.
   iii) Wood work in door and window frame.

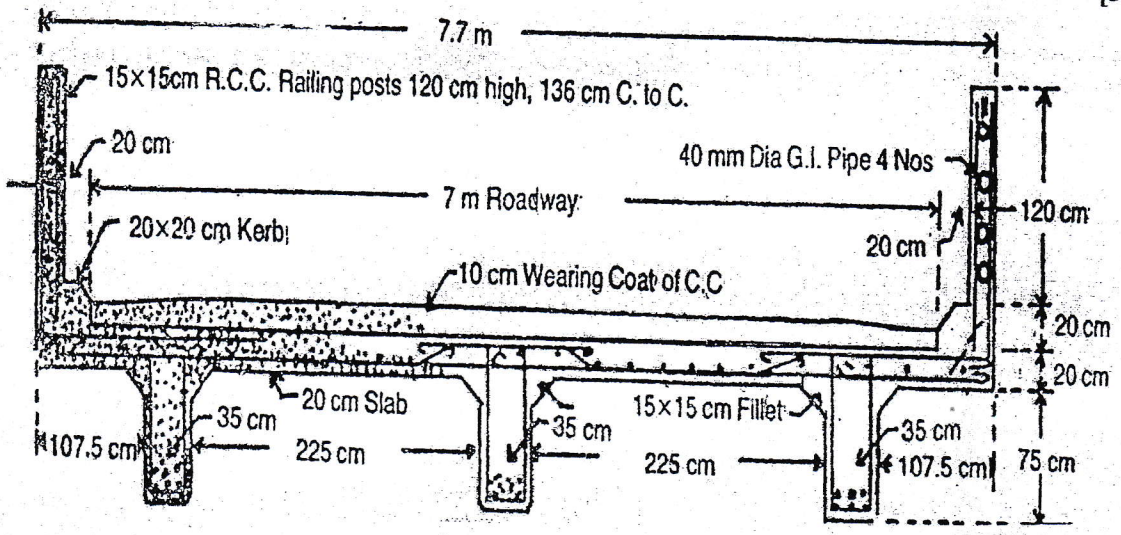
10. Estimate the quantity of earthwork of a hill road when the formation width in cutting is 4m and side slope is 2:1. The formation width in banking is 6m and side slope 3:1. The ground and formation level at the centre of road and also the transverse slopes of ground surface are as below: [10]

| Chainage (m) | 0 | 50 | 100 | 150 | 200 | 250 |
|---|---|---|---|---|---|---|
| RL of GL(m) | 1150.00 | 1150.60 | 1151.50 | 1150.80 | 1151.50 | 1152.00 |
| RL of FL(m) | 1149.20 | 1150.00 | 1150.80 | 1151.60 | 1151.50 | 1153.20 |
| Cross slope (m) | 1:10 | 1:1 | 1:14 | 1:12 | 0 | 1:10 |

11. Workout the quantity of well foundation of a bridge. The well is to be circular of 5m internal diameter with 800 mm wall in 1:6 cement and sand mortar. The well is to be founded on strata 15m below bed of river which is dry during winter. Bottom of the well is to be plugged with 1.5m thick cement concrete 1:4:8 and the top to be sealed with 1m thick cement concrete 1:2:4 and central portion is to be sand filled. [7]

12. Find out the quantities of the following items of work of a T-Beam decking of a bridge with 6m span and 45 cm bearing at ends.

i) RCC work (1:2:4) excluding steel
ii) Cement concrete (1:2:4) in wearing coat [5+2]

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04 TRIBHUVAN UNIVERSITY
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## *Subject:* - Estimating and Costing *(CE705)*

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- ✓ *Assume suitable data if necessary.*

1. Enlist the purposes of preparing an estimate of quantities of work and its cost. [4]
2. What are various methods of taking quantities of works? [4]
3. What are the components of a complete estimate? Prepare a sample of abstract cost [4+4]
4. Briefly explain the various factors that affect the rate analysis. Why is rate analysis in civil engineering necessary? [4+4]
5. Prepare quantities of material required of 12 mm thick (1:6) cement plastering per $10m^2$ in brick wall. [4]
6. Prepare rate analysis of plain cement concrete (1:3:4). Assume suitable rates of material and labor. [6]
7. What do you mean by Project estimate? How do you prepare project estimate? State the reports on estimate. [1+2+3]
8. Find the quantity of the following from attached drawing. (fig. 1) [3x4]
   a) Brick work in cement mortar (1:6) up to plinth.
   b) 10 mm thick cement plastering in ceiling and underside of roof projection.
   c) P.C.C. in foundation (1:3:6)
9. Find the quantity of earth work of a hill road from the following data. Formation width is 10 m, side slope in filling and cutting 2:1 and 1½ :1 respectively. [12]

| Chainage (m) | 0 | 100 | 200 | 300 | 400 | 500 | 600 |
|---|---|---|---|---|---|---|---|
| RL of Ground (m) | 1115.20 | 1116.10 | 1116.85 | 1118.00 | 1118.25 | 1118.10 | 1117.75 |

Formation: RL at chainage 0 is 1116.5 m, upward gradient 1 in 200 up to chainage 300m. Downward gradient 1 in 400 from chainage 300m to onward.

10. Find the quantity of earth work of irrigation canal using prismoidal method from the following data: [6]

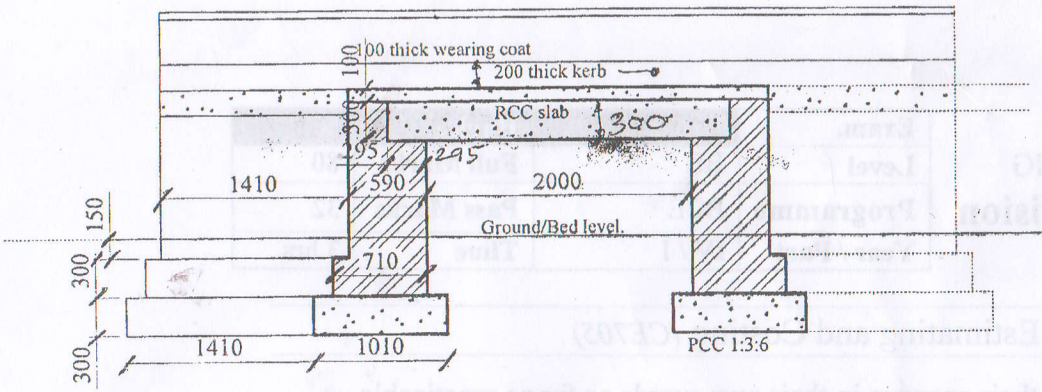
| Distance (m) | 0 | 50 | 100 | 150 | 200 |
|---|---|---|---|---|---|
| RL of Ground (m) | 100.00 | 101.00 | 101.00 | 99.00 | 100.00 |
| RL of Formation(m) | 99.50 | 99.00 | 89.50 | 89.00 | 88.50 |

Formation bottom width of canal is 6 meter and side slope 1:1.

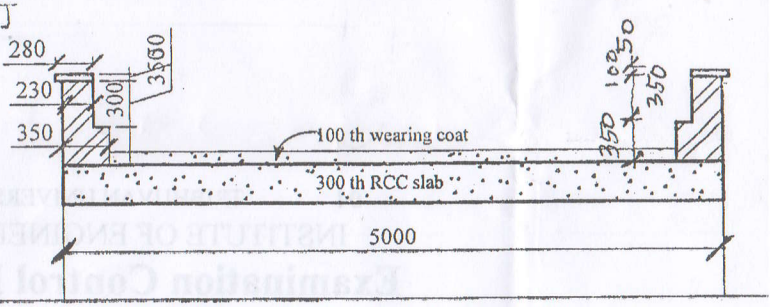
11. Workout quantity of (i) earth work excavation and (ii) brick work of slab culvert. (fig. 2) [4+6]

***

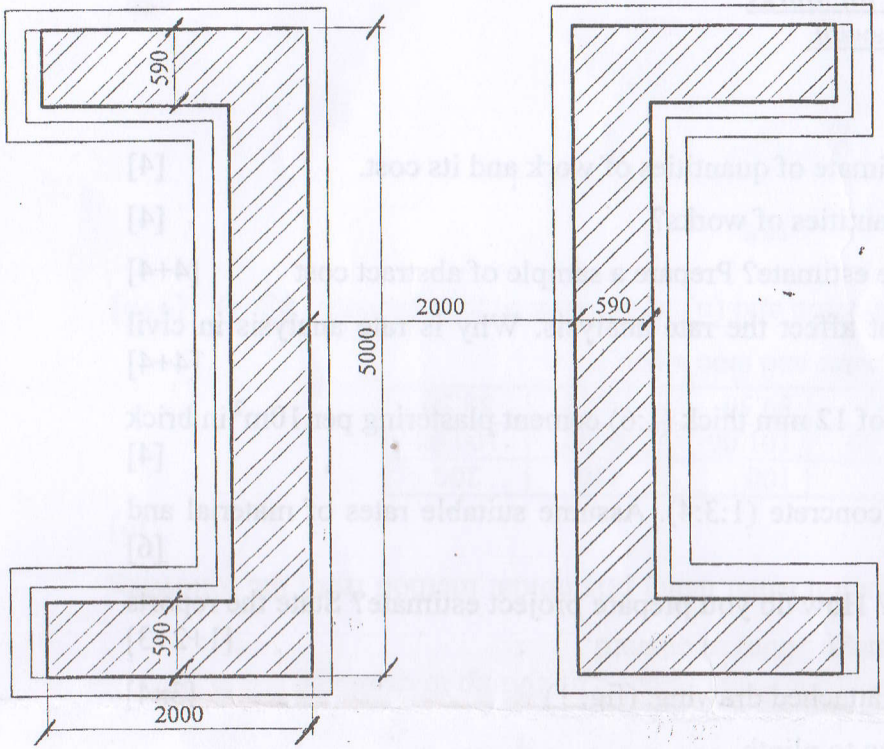
SLAB CULVERT



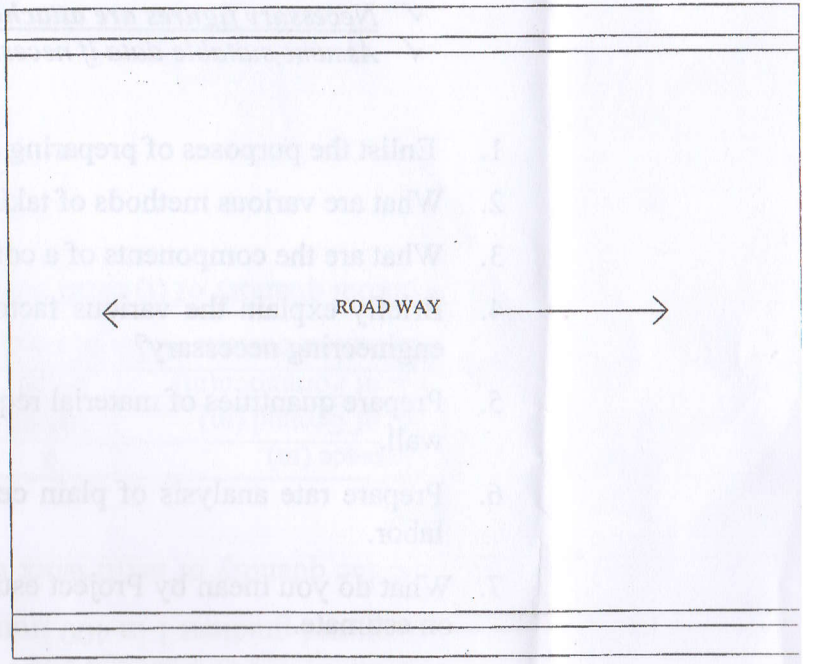

SECTIONAL ELEVATION




Cross-section



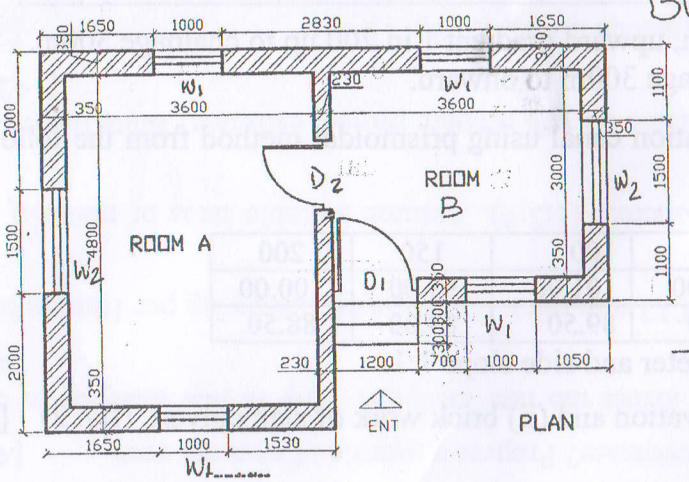

SECTIONAL PLAN



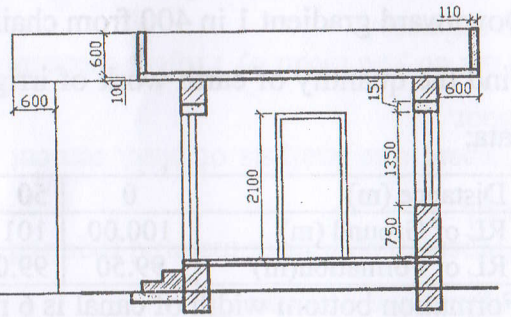

PLAN

Fig: 2

# BUILDING

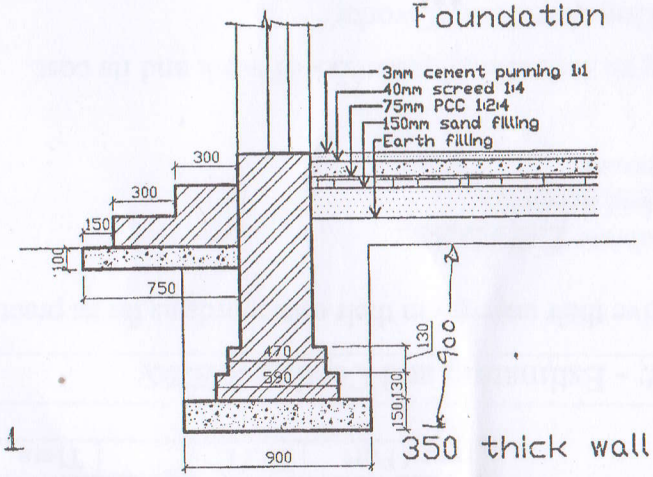



PLAN

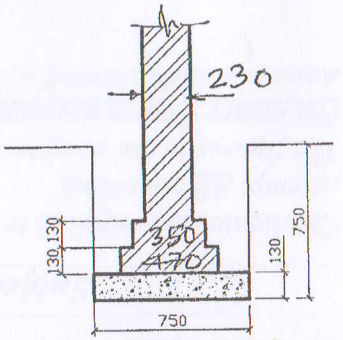



SECTION

## Foundation




350 thick wall




230 thick wall

Fig: 1

04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2074 Chaitra**

| Exam. | Regular | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Costing *(CE705)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. Write five units of measurement of each length, area and volume. [5]
2. Explain various methods of building estimate with suitable sketch. Explain the term contingencies and work charge establishment. [5+5]
3. Why revise estimate should be prepared? What is Rate analysis? Explain its important. [5]
4. Workout quantities of materials required in brickwork (consider brick size 230mm×110mm×55mm and mortar joint thickness as 10 mm) in cement mortar (1:6). Prepare rate analysis of plain cement concrete (1:2:4). Assume suitable rates of labor and materials. [14+6]
5. Define project. Discuss estimation of road project. [5]
6. Calculate the quantity of earthwork for a portion of hill road from following data: Formation width = 10 m in banking and 8 m in cutting, side slope in cutting = 1:1, side slope in filling = 2:1. [10]

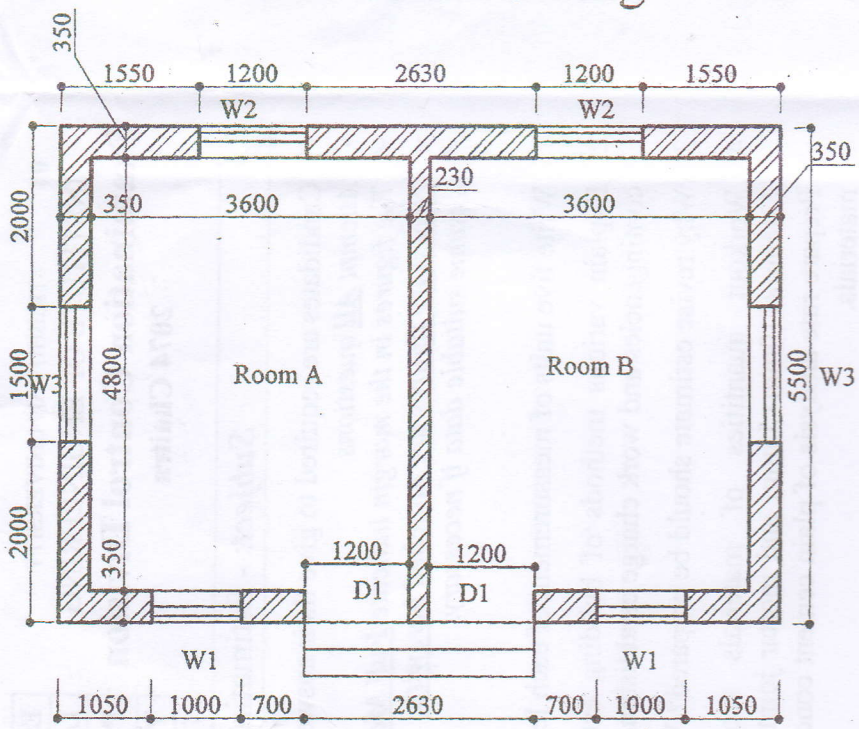
| Chainage | Cut depth | Fill height | Transverse slope |
|---|---|---|---|
| 0+060 | 0.5 | - | 10:1 |
| 0+090 | 0.6 | - | 15:1 |
| 0+120 | - | 0.7 | 12:1 |

7. A drawing of a building is attached herewith. Calculate the quantities of:
   i) Brickwork in cement mortar (1:6) up to plinth [10]
   ii) 35 mm thick paneled door shutters. [5]
   iii) 10 mm thick cement plaster in ceilings and underside of roof projection. [5]
8. Workout quantity of brickwork of a septic tank. [5]

***

P.T.O

# Two Room Building




Note: All dimensions are in millimeter
Assume necessary dimensions

**Foundation**

External wall:
Depth: 900
Width: 900
Concrete depth:150
Footings, width and depth:
1st footing: 590 and 130
2nd footing: 470 and 130
3nd footing and plinth: 350 th
Plinth height: 450
Sill height:750

Internal wall:
Depth: 750
Width: 750
Concrete depth:130
Footing width and depth:
1st footing: 470 and 130
2nd footing: 350 and 130
3nd footing and plinth: 230
Plinth height: 450
Sill height : 750

**Steps:**

Tread: 300
Riser: 150
100 th. PCC

**Roofs:**

RCC Slab thickness: 100
Projection: 600
Parapet wall: 110 thick, 300 high at the end of roof projection

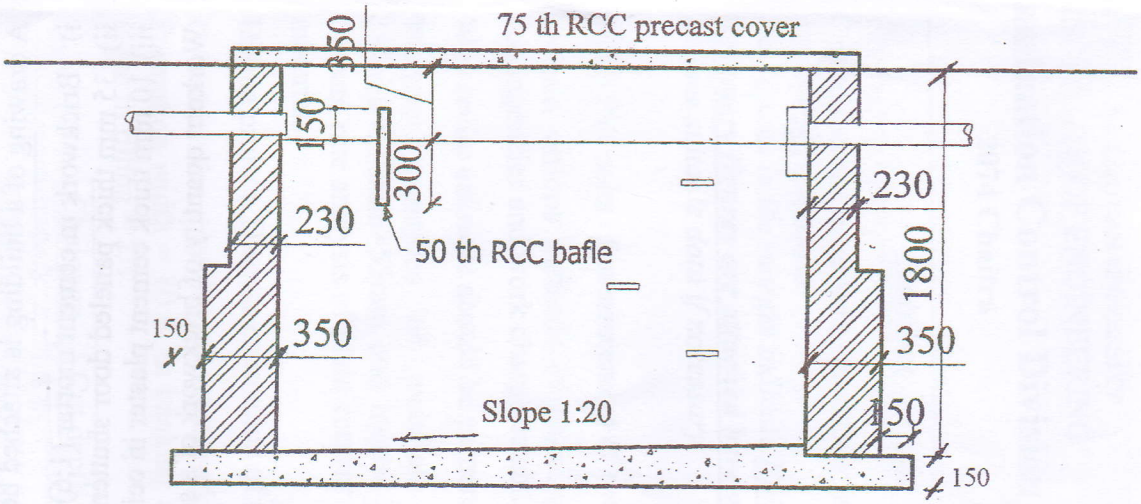
**Superstructure**

Floor to floor height: 2700
External wall: 350
Internal wall:230

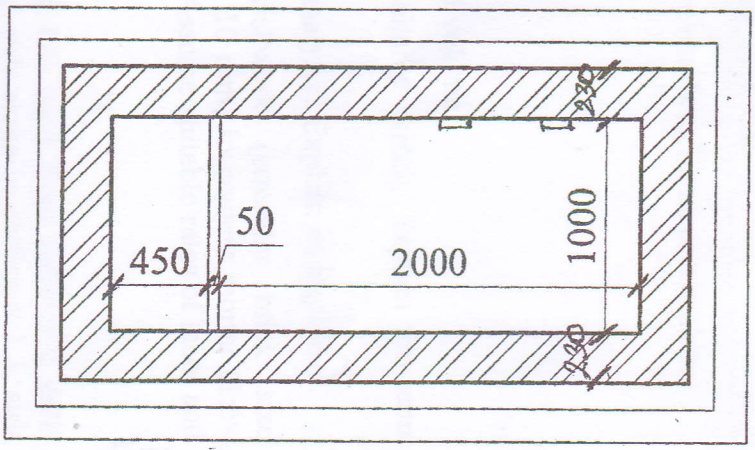
**Openings**

Doors D: 1200x2100
Windows W1: 1000x1000
Windows W2: 1200x1200
Windows W3 1200x1200
Frame size: 75x100
Doors and windows shutter: 35 thick

# SEPTIC TANNK




SECTION




PLAN

05 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2074 Ashwin**

| Exam. | Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

***Subject:*** - Estimating and Costing *(CE705)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

a) Mention the various purposes of Estimating. [4]

b) Write the units of measurement and payment for the following items of work: [4]

(i) Surface excavation (ii) Brick work in well steining
(iii)Lightening conductor (iv) Cornice

2. Describe how will you prepare a detailed estimate of a building. [6]

3. Under what circumstances the following types of estimates prepared? [6]

a) Preliminary estimate b) Revised estimate c) Supplementary estimate

d) Complete estimate

4. a) What are the factors on which the unit rates of particular item of work depends? [4×3]

b) Calculate the quantities of materials required for the following items of work:

(i) 75 $m^3$ of Brick work in (1:3) cement mortar
(ii) 115 $m^2$ of 75 mm thick PCC (1:2:4) in floor

c) Prepare an analysis of rate for WC Pan with low level Cistern.

***OR***

Prepare an analysis of rate for providing, laying and consolidation of 40mm thick Premix Asphalt carpeting per $m^2$.

5. a) A town planning authority has to acquire an area of 500000 $m^2$ for the development of new colony. After developing the area it is proposed to be sold at Rs 50.00 per $m^2$. Workout the maximum compensation which can be given to the owners whose land is to be acquired for the development of the colony, assuming: [8]

(i) the authority is establishment charges 15% on the sale price
(ii) 40% area is to be provided for roads, parks etc
(iii)Colony improvement expenditure Rs 8.00 per $m^2$
(iv)Engineers and architect's fee for surveying and planning the colony at 4% on the sale price

b) Write short notes on: [6]

(i) Scrap value (ii) Depreciation
(iii)Sinking fund (iv) Capitalized value

6. Estimate the quantities of the following items of work from the accompanying RCC slab culvert drawings: [12]

   a) Earthwork in excavation in foundation
   b) PCC (1:3:6) in foundation
   c) Brick work in (1:4) cement mortar
   d) PCC (1:2:4) for RCC slab

7. Estimate the quantities of the following items of work from the accompanying Building drawings: [12]

   a) Earthwork in excavation in foundation
   b) Panelled door shutter
   c) Brick work in foundation and plinth

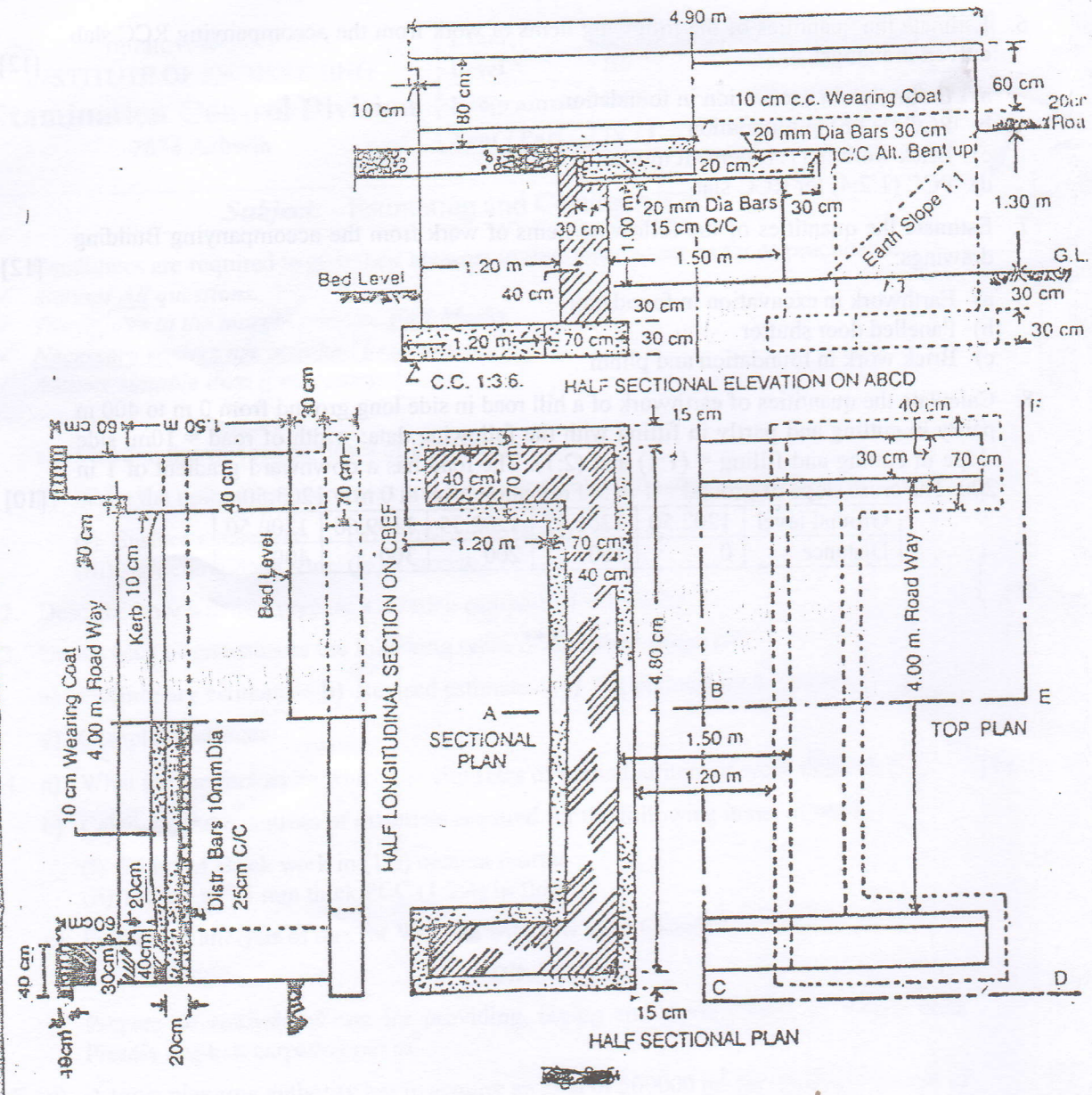
8. Calculate the quantities of earthwork of a hill road in side long ground from 0 m to 400 m partly in cutting and partly in filling with the following data: width of road = 10m, side slope in cutting and filling = (1:1) and (2:1). The road has a downward gradient of 1 in 200. The cross slope of ground = 1 in 5. Formation level at 0 m = 1203.50m. [10]

| Ground level | 1202.50 | 1201.97 | 1202.35 | 1199.66 | 1200.50 |
|---|---|---|---|---|---|
| Distance | 0 | 100 | 200 | 300 | 400 |

***

Assume suitable rates.

R.C.C. SLAB CULVERT 1.50 m SPAN with standard modular bricks



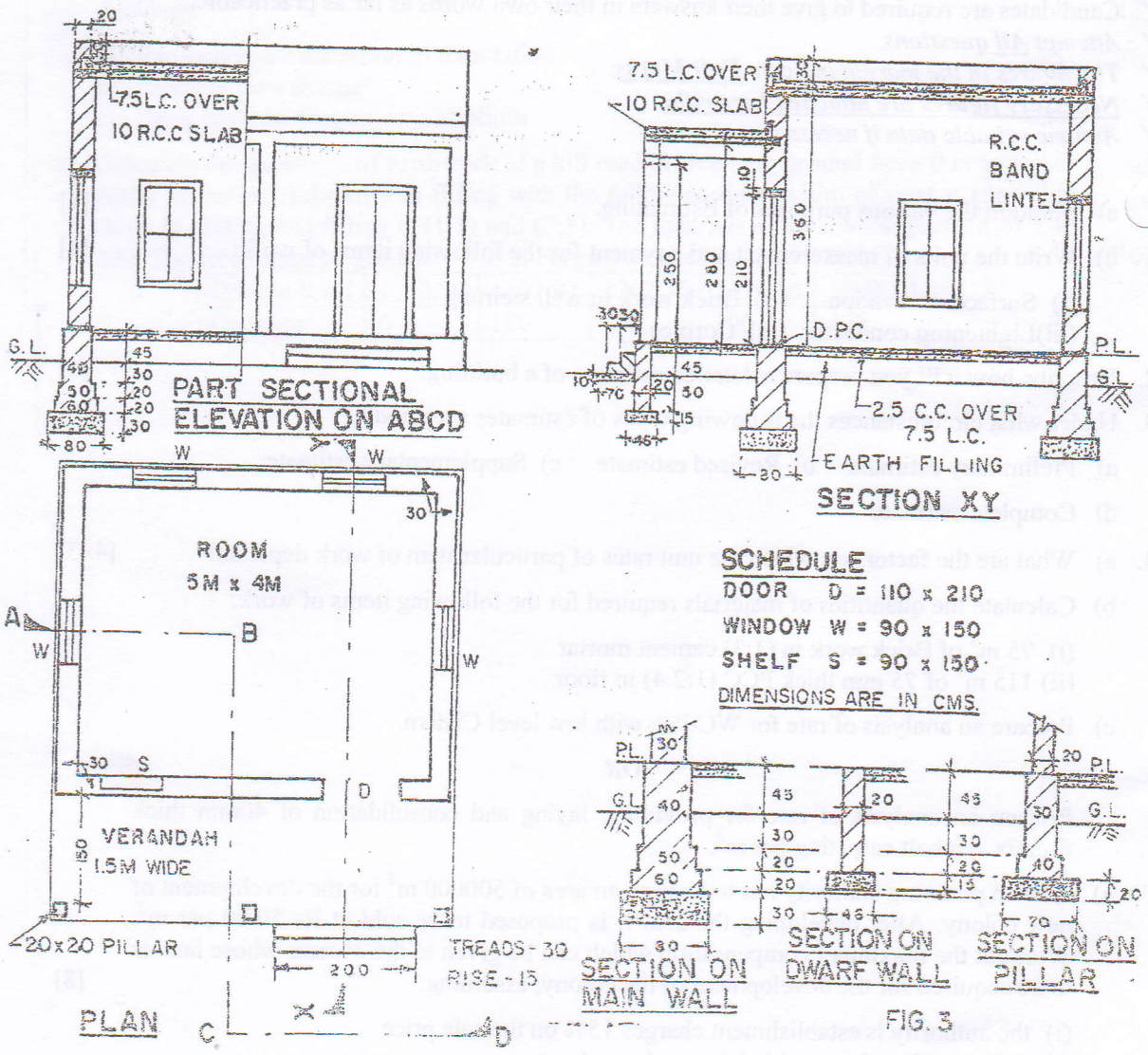

7.5 L.C. OVER
10 R.C.C SLAB
G.L.
PART SECTIONAL
ELEVATION ON ABCD
7.5 L.C. OVER
10 R.C.C. SLAB
R.C.C.
BAND
LINTEL
D.P.C.
P.L.
G.L.
2.5 C.C. OVER
7.5 L.C.
EARTH FILLING
SECTION XY
ROOM
5M x 4M
VERANDAH
1.5M WIDE
20x20 PILLAR
TREADS - 30
RISE - 15
PLAN
SCHEDULE
DOOR D = 110 x 210
WINDOW W = 90 x 150
SHELF S = 90 x 150
DIMENSIONS ARE IN CMS.
SECTION ON
MAIN WALL
SECTION ON
DWARF WALL
SECTION ON
PILLAR

FIG. 3

06 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2073 Shrawan**

| Exam. | New Back (2066 & Later Batch) | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

***Subject:*** - Estimating and Costing *(CE705)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) Describe the term estimate. State the necessity of estimated cost in construction work. Mention the various requirements for preparing detailed estimate. [2+2+2]

   b) (i) Describe briefly how will you prepare a detailed estimate of a building. [2×5]

   (ii) Prepare bill of quantities from the following data for the construction of RCC T-beam Decking bridge.

| Quantity of work | Detail of work | Rate per unit of work |
|---|---|---|
| 108 $m^3$ | PCC (1:1:2) for RCC works | Rs 13,200.00 |
| 3240 $m^2$ | Formwork for RCC works | Rs 750.00 |
| 21600 kg | Steel reinforcement for RCC works | Rs115.00 |
| 18 $m^3$ | PCC (1:2:4) wearing coat | Rs 12090.00 |

2. a) What are the different methods of preparing approximate estimate? Write the suitability of each method. [6]

   b) Estimate the quantities of the following items of work from the accompanying BUILDING drawings. [10]
   - i) Lime concrete in foundation
   - ii) Brick work in second footing
   - iii) DOOR shutters
   - iv) 25 mm thick DPC

3. i) What are the purposes of analysis of rate? Which points are taken into consideration while preparing analysis of rate? [4×4]

   ii) Estimate the quantities of cement, sand and coarse aggregate required for 12 cm thick RCC slab of (1:1½:3) mix proportion. The outside dimensions of slab are 4.20m×3m.

   iii) Calculate the quantities of materials required for 115m3 of brick masonary in (1:3) cement mortar, (the size of brick is 240×115×60 mm and thickness of mortar is 12 mm)

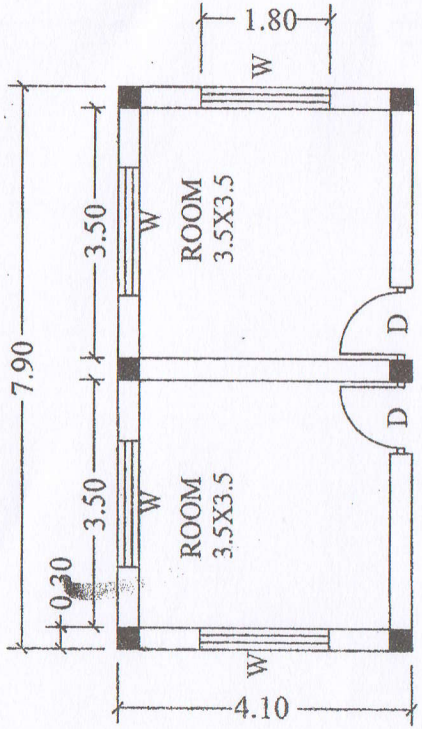
   iv) Prepare an analysis of rate for 12 mm thick cement plaster (1:3) in ceiling per $10m^2$.

4. Calculate the following items of work from the attached building drawing. [16]
   - i) Earthwork in excavation
   - ii) Stone soling in foundation and sand filling in floor.
   - iii) PCC for RCC upto plinth beam
   - iv)Brick work upto plinth

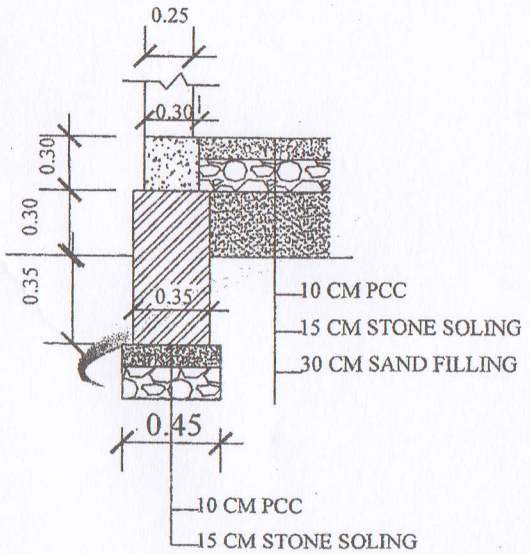
5. Prepare an estimate of earthwork for a road portion from the following data: [16]
   Formation width =8 m in cutting and 10 m n banking
   Side slope in cutting = 1:1
   Side slope in Banking = 2:1 (H:V)

| RD: | 0 | 30 | 60 | 90 | 120 |
|---|---|---|---|---|---|
| RLS of ground: | 507.0 | 507.95 | 507.30 | 506.90 | 506.50 |
| Formation level: | 507.0 and upward gradient @ 1 is 150 | | | | |
| Cross slope of ground: | 1:10 | 1:12 | 1:10 | 1:12 | 1:10 |

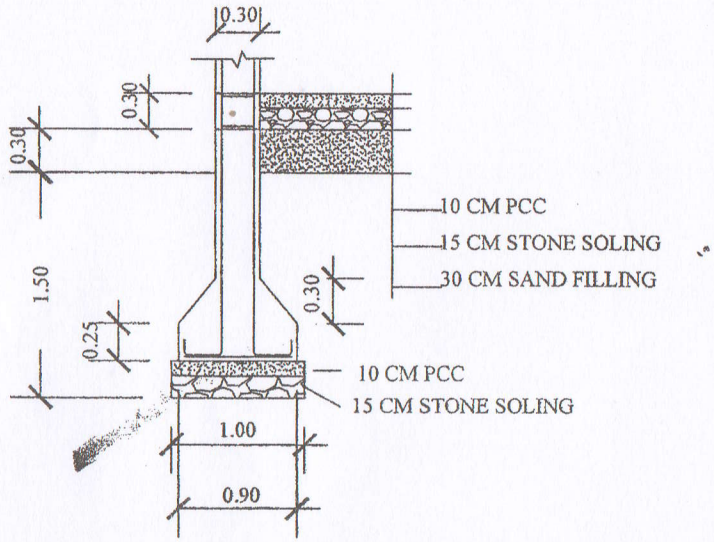
***

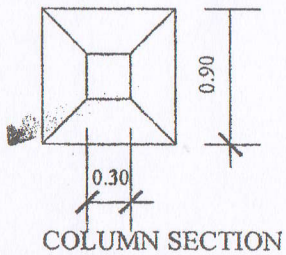



PLAN




WALL SECTION




COLUMN SECTION

NOTE
ALL DIMENSION ARE IN METRE
DRAWING IS NOT IN SCALE

OPENING SCHEDULE
DOOR D-1.0x2.1
WINDOW-1.8x1.5

SECTION
COLUMN: 0.30x0.30
FOOTING: 0.90x0.90
PLINTH BEAM:0.30x0.30

04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2071 Chaitra**

| Exam. | Regular | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

***Subject:*** - Estimating and costing *(CE705)*

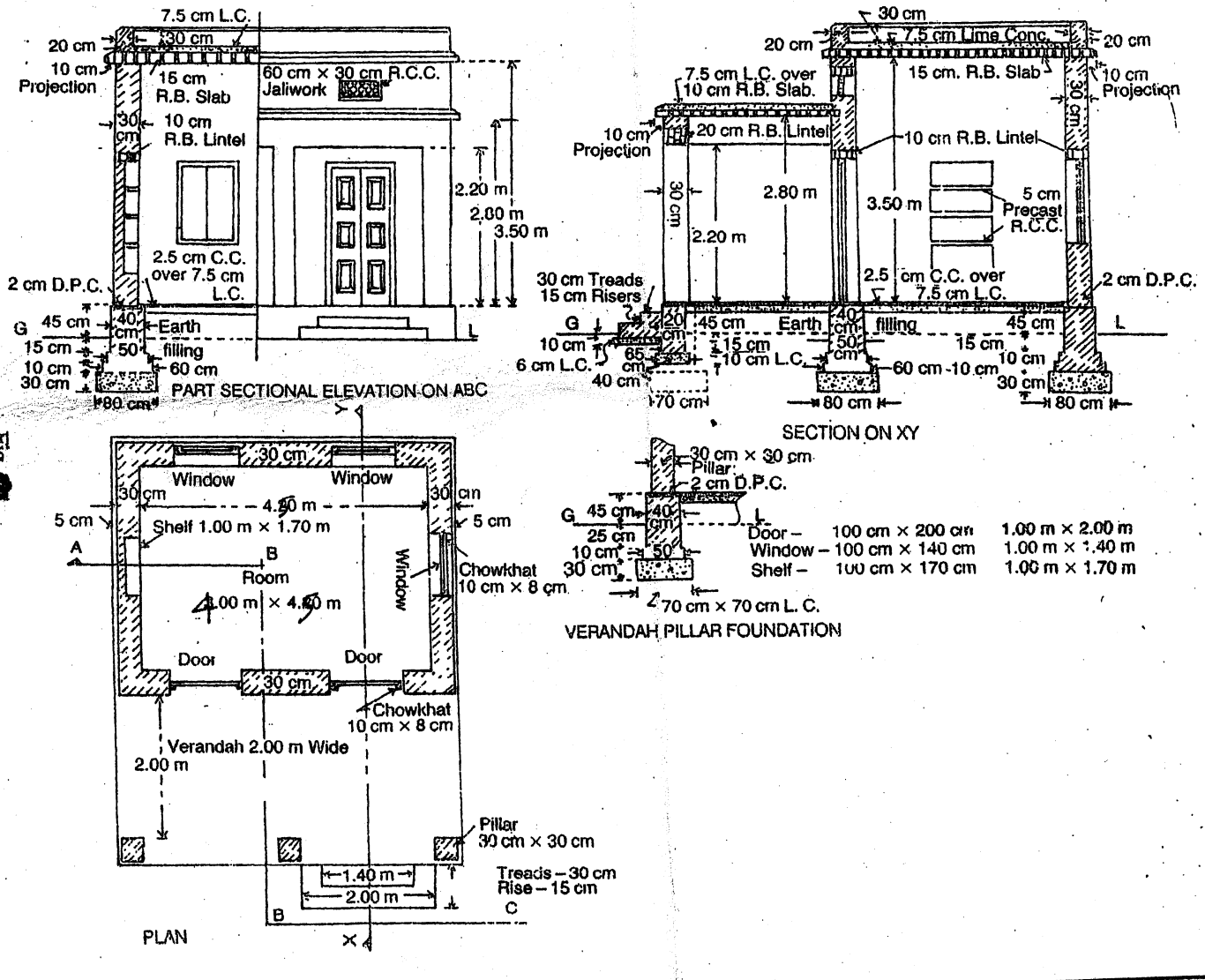
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. Explain with example process of preparation of a preliminary estimate of a office building. [5]
2. a) Explain with neat sketches to workout quantity of semi-circular arch (span, thickness and rise of arch given). [4]
   b) Prepare tables of quantity sheet and abstract cost for a residential building. [3]
   c) What is Bill of quantities? State its importance. [3]
3. List most common units of measurement and payment for civil works and sanitary works (at least five from each). [5]
4. a) Prepare materials required for an items of brickwork in cement mortar (1:4). Size of brick is 230mm×110mm×55mm, with mortar joint 10mm. [6]
   b) Prepare rate analysis for 20mm thick cement sand plaster (1:4) in wall per $100m^2$. [6]
   c) Explain various factors which affects the rate analysis. [6]
5. Define project. Discuss estimate of irrigation project. [5]
6. a) Estimate detailed quantities for the following items form attached building drawing:
      i) Earth work in excavation in foundation [4]
      ii) Brick work in cement sand (1:6) mortar up to plinth [4]
      iii) 40 mm thick sal work wood paneled door shutter [4]
      iv) 12 mm thick inside cement plaster (1:6) [4]
   b) Calculate the quantities of earthwork of a portion of hill road from the following data: [12]
      Formulation width = 8m, side slope in cutting and filling = (1:1) and (2:1)

| Distance | Depth of cut | Depth of fill | Cross slope of ground |
|---|---|---|---|
| 0 m | 0.30 | - | 10:1 |
| 30 m | 0.20 | - | 15:1 |
| 60 m | - | 0.50 | 12:1 |
| 90 m | - | 0.70 | 8:1 |

   c) Workout the quantity of well foundation of a bridge. The well is to be circular of 4.5 meter internal diameter with 800 mm wall in 1:6 cement and sand mortar. The well to be founded on strata 15 meter below bed of river which is dry during the hot weather. Bottom of the well to be plugged with 1.0 meter thick cement concrete 1:4:8 and the top to be sealed with 0.75 meter thick cement concrete 1:4:8 and central portion is to be sand filled. [9]

***


7.5 cm L.C.
30 cm
20 cm
10 cm Projection
15 cm R.B. Slab
60 cm × 30 cm R.C.C. Jaliwork
30 cm
10 cm R.B. Lintel
2.20 m
2.80 m
3.50 m
2.5 cm C.C. over 7.5 cm L.C.
2 cm D.P.C.
G
45 cm
40 cm
Earth filling
15 cm
50 cm
10 cm
60 cm
30 cm
80 cm
PART SECTIONAL ELEVATION ON ABC
30 cm
7.5 cm Lime Conc.
20 cm
7.5 cm L.C. over 10 cm R.B. Slab.
15 cm. R.B. Slab
10 cm Projection
20 cm R.B. Lintel
10 cm R.B. Lintel
5 cm Precast R.C.C.
30 cm Treads
15 cm Risers
6 cm L.C.
65 cm
10 cm L.C.
70 cm
SECTION ON XY
30 cm × 30 cm Pillar
25 cm
70 cm × 70 cm L. C.
VERANDAH PILLAR FOUNDATION
Door – 100 cm × 200 cm 1.00 m × 2.00 m
Window – 100 cm × 140 cm 1.00 m × 1.40 m
Shelf – 100 cm × 170 cm 1.00 m × 1.70 m
Window
4.20 m
5 cm
Shelf 1.00 m × 1.70 m
A
B
Room
4.00 m × 4.20 m
Chowkhat 10 cm × 8 cm
Door
Verandah 2.00 m Wide
2.00 m
Pillar 30 cm × 30 cm
1.40 m
Treads – 30 cm
Rise – 15 cm
C
PLAN

05 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2070 Chaitra**

| Exam. | Regular | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

***Subject:*** - Estimating and Costing *(CE705)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the **margin** indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) What are the purposes of Estimating and Costing? Explain the data required for Estimating. [3+5]
   b) Explain in short the various methods of taking quantities in building works. [4]
2. a) What do you understand by approximate estimate? When do you need revised estimate? And Why? Explain. [4+4]
   b) What are the purposes of Rate Analysis? Prepare Rate analysis of the following: [4+4+4]
      i) 1st class brick work is 1:6 C.S mortar per $m^3$
      ii) 25 mm thick premix carpeting per $m^2$ W.C commode low level cistern per no.
3. a) What are the works that an estimator has to take account in project estimate? Explain. [6]
   b) Find out the quantities of the following items of work of a T-beam seeking of a bridge with 6 m span and 45 cm bearing at ends. [5+3]
      i) RCC work (1:2:4) excluding steel
      ii) Cement concrete (1:2:4) in wearing coat
4. Prepared a detailed estimate of the following items of work of a building (drawing attached here with) [5+4+5]
   i) Earth work in excavation
   ii) PCC (1:3:6) in foundation
   iii) Brick work is 1:6 c.s mortar in foundation and phith
5. Estimate the quatities of earthwork for a portion of a hilly road from following data: [10]

   Formation width = 10 m
   Side slopes in cutting = 1:1 and in Banking = 2:1 (H.V) length of chain = 30 m

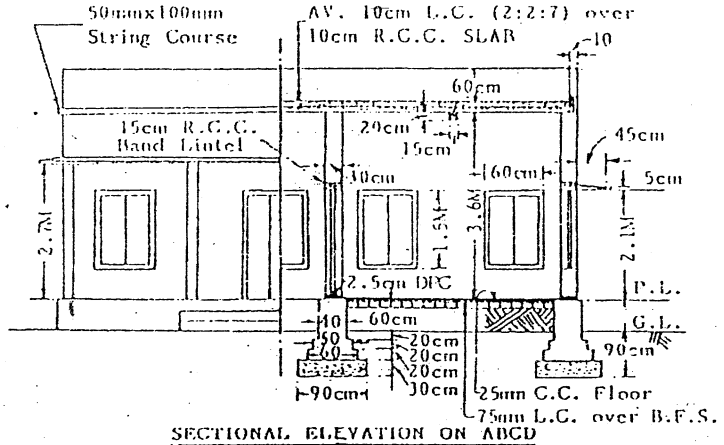
| Chainage: | 12 | 13 | 14 | 15 |
|---|---|---|---|---|
| Depth of cut: | 0.4 | 0.2 | - | - |
| Ht.of Banking: | - | - | 0.3 | 0.5 |
| Transverse slope of ground: | 1:10 | 1:12 | 1:10 | 1:8 |

6. Calculate the quantity of earth work for a portion of channel with the following data: [10]
   - Bed width = 3 m
   - Free Board = 0.44 m
   - Side slope for digging = 1:1
   - Side slope for Banking = 1: 1½ (V:H)
   - Fully supply depth = 1 m
   - Top width of bank =1.5 m

| Chainage: | 0 | 30 | 60 | 90 | 120 | 150 |
|---|---|---|---|---|---|---|
| RL of GL: | 225.24 | 224.8 | 224.43 | 224.12 | 224.5 | 224.98 |
| Proposed level: | 224.00 | 223.94 | 223.88 | 223.82 | 223.76 | 223.7 |

   Also draw a typical X-section.

***



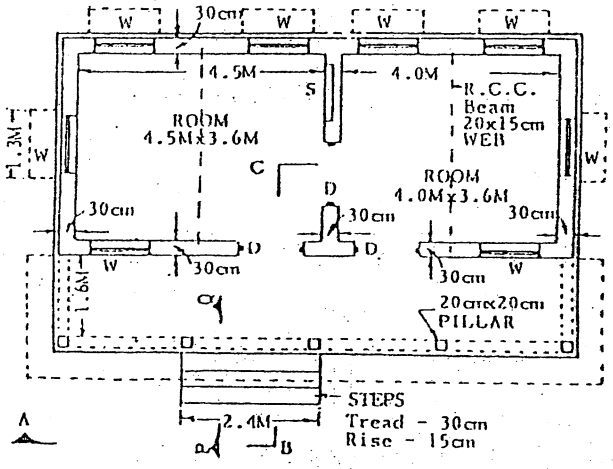

SECTIONAL ELEVATION ON ABCD

Schedule

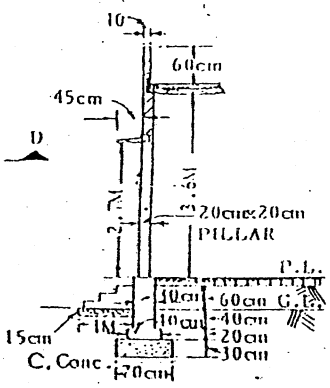
DOOR :
D = 1.2M x 2.1M
FRAME
= 10cm x 8.0cm

WINDOW :
W = 1.1M x 1.5M
FRAME
= 10cm x 8.0cm

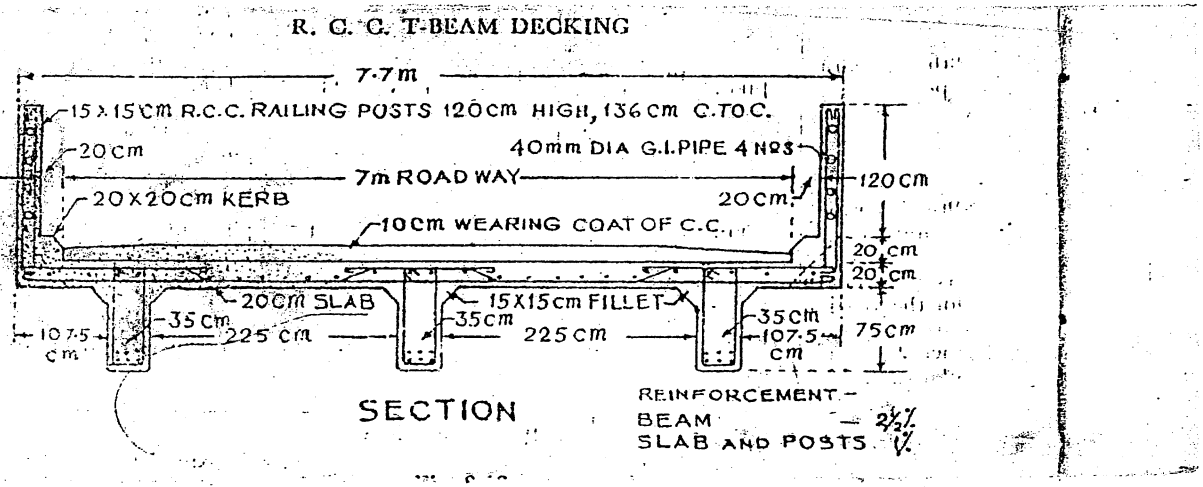
SHELF
S = 1.1M x 1.5M
20cm Deep




PLAN




SECTION ON PQ



05 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
2068 Baishakh

| Exam. | Regular / Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Valuation

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) How are the following items of work measured? What are their units of measurement and payment? (i) Pointing work (ii) Steel reinforcement [3]
   b) Explain what do you understand by: (i) Bill of quantities (ii) Contingency [3]
   c) Explain why approximate estimate of any structure is done before the detailed estimate and final cost is worked out? [4]
2. Describe how will you prepare a detailed cost estimate of a building. [4]
3. a) What do you mean by analysis of rates? What are the requirements of rate analysis? [2]
   b) Calculate the quantities of materials required for the following items of work: [2×3]
      i) $105m^3$ of PCC (1:4:8) in foundation
      ii) $725m^2$ of 20mm thick cement plaster (1:4) in wall.
   c) Prepare an analysis of rate of brick masonry in (1:5) cement mortar in super structure. Assume size of brick 240 × 130 × 65mm and thickness of mortar joint is 12mm. [4]

   ***OR***

   Prepare an analysis of rate for 40mm thick asphalt concrete wearing coat per $10m^2$.
   d) Prepare an analysis of rate for W.C. commode with low level cistern. [4]
4. a) What are the factors which should be kept in mind while evaluating fair and reasonable value of the property? [4]
   b) Discuss the various methods of valuation of the property. [4]
   c) Workout the valuation of a cold storage with the following data: [8]
      i) Cost of land = Rs. 20,00,000.00
      ii) Gross income per year = Rs. 95, 00, 000.00
      Expenses incurred per year are as follows:
      iii) Staff salary, electricity charges at the rate of 25% of gross income.
      iv) Repair and maintenance of machinery, plants, equipments etc at the rate of 5% of their capital cost, which is Rs. 15,00,000.00.
      v) Sinking fund for machinery, plants etc with 25 yrs life at the rate of 4% after allowing 10% scrap value.
      vi) Insurance premium per year is Rs. 15,000.00

      Assume year's purchase for 60 yrs at the rate of 8% and redemption of capital at the rate of 4%.
5. a) Estimate the quantity of Earthwork of a portion of road from the following data: [8]

Formation width of the road = 10m
Side slope in banking = 2:1 (H:V.) Side slope in cutting = 1:1
Downward grade 1 in 120 from distance 0 to 30m while it remains in level from distance 30m to 90 m and have again upward grade 1 in 90 from distance 90 to 120m.
The formation level at distance 60m = 1197.50m.

The ground levels of the centre line of road are as under:

| R.L. of ground | 1198.65 | 1196.40 | 1199.30 | 1200.40 | 1198.10 |
|---|---|---|---|---|---|
| Distance in m. | 0 | 30 | 60 | 90 | 120 |

b) Work out the quantity of Earth work in cutting and filling of a portion of a hill road as per data given below: [10]

Cross slope = 1 in 5
Formation width = 8m
Side slope in cutting = 1:1
Side slope in filling = 2:1

| R.L. of formation | 699.20 | 702.20 | 704.20 |
|---|---|---|---|
| R.L. of ground | 698.80 | 700.00 | 706.20 |
| Distance(m) | 0 | 30 | 60 |

6. Estimate the quantity of the following items of work from the accompanying building drawings: [3+5+4+4]

i) PCC (1:3:6) in foundation
ii) Brick work in (1:6) cement mortar in foundation and plinth.
iii) Salwood work for doors and windows frame
iv) PCC M20 for R.C.C. slab

***

06 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
2067 Ashadh

| Exam. | Regular/Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Valuation

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) What is an estimate? What is meant by ~~quality~~ quantity survey? Distinguish between estimated cost and actual cost. [3]

   b) What is meant by analysis of rate? What are the factors which affect the rate analysis? [3]

2. a) Prepare a preliminary estimate of two storied health post building to get administrative approval of Ministry. Data are given as below. [6]

   30% built up area is occupied by circulation space.
   10% built up area is occupied by walls.
   Plinth area rate is Rs. 18000.00/sq.m.
   Extra cost for interior design 1% of building cost.
   Extra cost for electrical installation 8% of building cost.
   Extra cost for other service 5% of building cost.
   Contingency = 5%
   Supervision charge = 3%

   b) How are the following items of work measured? [4]

   i) Plaster work
   ii) Cornice work

   c) Write short notes on: (any three) [3×2]

   i) Overhead charge
   ii) Task or out turn of work
   iii) Salvage value and scrap value
   iv) Sinking fund

3. a) Prepare an analysis of rate for M20 (1:1½:3) for RCC work per $10m^3$. [6]

   b) Calculate the quantities of materials required for following works: [2×4]

   i) $10m^3$ brick masonry in 1:6 cement mortar
   ii) $10m^3$ PCC (1:3:6) in foundation

4. a) Why valuation of property is required? Differentiate between obsolescence and depreciation. [5]

   b) Mention the various data you will need to collect as a valuator for land valuation. [4]

c) A town planning authority has to acquire an area of 4,50,000$m^2$ for the development of a new colony. After developing the area it is proposed to be sold at a rate of Rs. 40.00 per $m^2$. Work out the maximum compensation which shall be given to the land owners, whose land is to be acquired, assuming: [7]

i) The town planning authority's establishment charges @ 15% on the sale price.
ii) 35% area is to be provided for roads, parks and other public amenities.
iii) Colony improvement expenditure @ Rs. 6.00 per $m^2$.
iv) Engineer's and Architect's fee for surveying and planning the colony @ 4% on the sale of plots.

5. a) Estimate the quantity of earthwork in cutting and filling from the following data for a portion of road. [7]

Formation width = 10m
Side slope in banking = 2:1
Side slope in ~~banking~~ cutting = 1:1

| Chainage | Depth of cutting (m) | Height of filling (m) | Cross slope of ground |
|---|---|---|---|
| 0 | 0.60 | — | 10:1 |
| 20 | 0.30 | — | 8:1 |
| 40 | 0.50 | — | 12:1 |
| 60 | — | 0.35 | 10:1 |
| 80 | — | 0.70 | 12:1 |

b) Find out the quantity of earthwork of a portion of road to be constructed with the following data: [7]

Formation width of the road throughout = 10m
Side slope in banking (2:1) and side slope in cutting (1:1)
Downward grade 1 in 120 from distance 90m to 120m. While it remains in level from distance 120m to 180m and have again upward grade 1 in 90 from distance 180m to 210m.
The formation level at distance 180m = 1197.50m.
The ground levels are as under

| R.L. of ground | 1198.65 | 1196.40 | 1199.30 | 1200.40 | 1198.10 |
|---|---|---|---|---|---|
| Distance (m) | 90 | 120 | 150 | 180 | 210 |

6. Estimate the quantities of the following items of work from the accompanying drawing. [14]

a) Earthwork in excavation
b) Cement concrete
c) 1st class brick work
d) RCC work

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01R TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
2067 Poush

| Exam. | Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Valuation

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) Describe how will you prepare a preliminary estimate of a government office building for administrative approval of government including external services. The external services should be specified [5]

   b) How are the following items measured? [5]
   i) Plaster work ii) Cornice work

2. a) Prepare an analysis of rate for p.c.c (1:3:6) pr $m^3$. [6]

   b) Calculate the quantities of materials required for the following works: [10]
   i) $150m^3$ of brick work in (1:4) cement mortar in super structure
   ii) $120m^2$ of 20mm thick cement sand plaster(1:4)

3. a) Distinguish clearly between: [6]
   i) Value and cost ii) Salvage value and scrap value
   iii) Cost based method of valuation and development method of valuation

   b) A building is situated in a town on a land measuring $600m^2$. The area of the built up portion is 20m × 15m. The building is provided with water supply, sanitary and electrical fittings and is of very sound construction and the life of which may be assumed as 100 yrs. Work out the valuation of the property, if the age of the building is 30 yrs. The prevailing built area rate is Rs 15000.00 per $m^2$ and value of land is Rs 500.00 per $m^2$ plinth [10]

4. a) Find out the quantity of earth work of a portion of road to be constructed with the following data: [10]

   Formation width of the road = 10m
   Side slopes in banking and cutting = (2:1) and (1:1)
   Downward grade 1 in 120 from distance 90 to 120m while it remains in level from distance 120 to 180m and again upward grade in 1 in 90 from distance 180 to 210m.
   The formation level at distance 150m = 1197.50

| R.L. of ground | 1198.65 | 1196.40 | 1199.30 | 1200.40 | 1198.10 |
|---|---|---|---|---|---|
| Distance (m) | 90 | 120 | 150 | 190 | 210 |

   b) Calculate the quantity of earthwork in cutting and filling in a portion of a hill road from km 8.50 to km 9.00 having cross slope (transverse slope) of ground in 5 with the following data. [10]

   Formation width of road = 8m
   Side slope in cutting = (1:1)
   Side slope in filling = (2:1)
   Depth of cut at centre line at km 8.50 = 40cm
   Depth of cut at centre line at km 9.00 = 80cm

5. Estimate the quantities of the following items of work from the accompanying drawing: [18]
   a) Earth work in excavation in foundation b) Brick work in foundation and plinth
   c) Inside wall and ceiling cement plaster d) Brick work in superstructure

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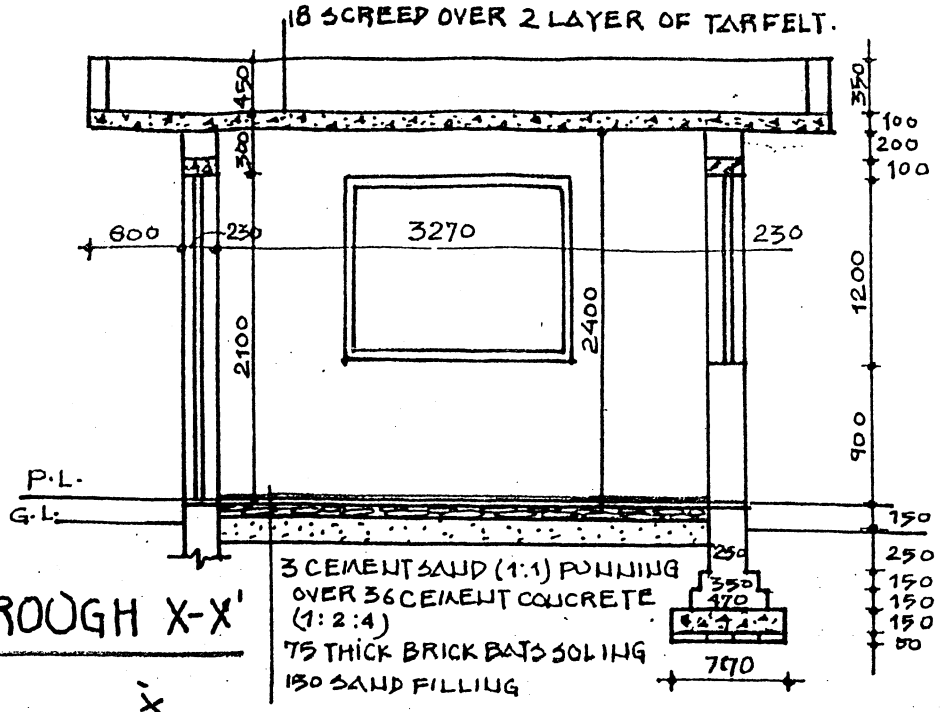
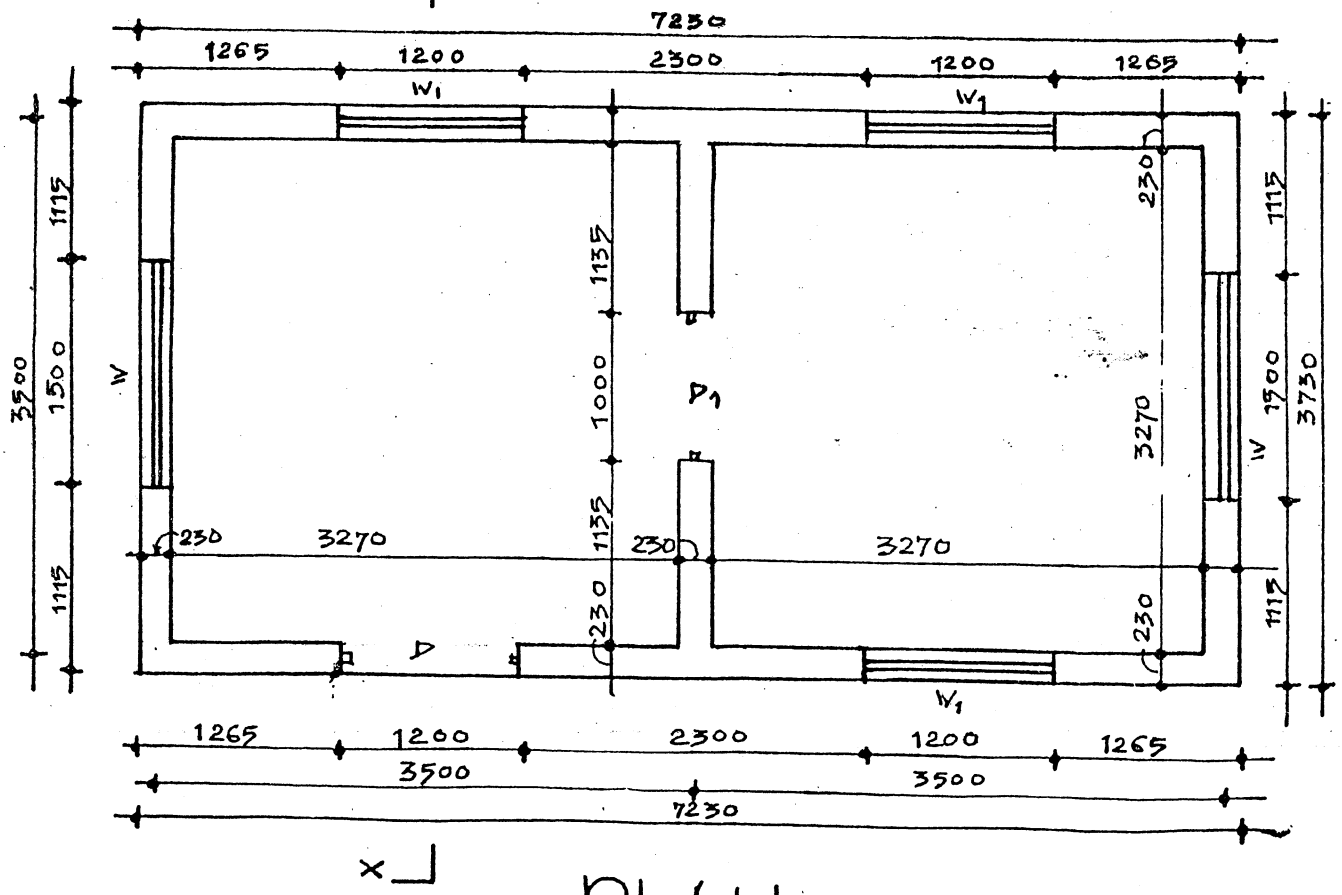



## SECTION THROUGH X-X'




## PLAN.

### DOORS AND WINDOWS SCHEDULE

D – 1200 X 2100
$D_1$ – 1000 x 2100
W – 1200 X 1200
$W_1$ – 1200 X 1200

05 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
2066 Bhadra

| Exam. | Regular / Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Valuation

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figures are attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) What are the purposes of estimating? 'An estimate is never the actual cost of the work', justify your answer. [5]

   b) What are the different types of estimates? How do they differ from each other? [5]

2. a) Prepare a preliminary estimate of a 4 storied office building having total carpet area of 2000$m^2$ for obtaining the administrative approval of the ministry. Given the following data. 30% built up area will be taken up by corridors, verandah, toilets, staircase etc and 10% of the built up area will be occupied by walls. [7]

   Plinth area rate is Rs. 15000/sqm
   Extra for special architecture treatment 1.5% of building cost
   Extra for electrical installation 8% of building cost
   Extra for other services 5% of building cost
   Contingencies 5% of building cost
   Supervision charge 5% of building cost

   b) Write short notes on (any three): [6]

   i) Approximate estimate
   ii) Revised estimate
   iii) Centre line method
   iv) Capitalized value

3. a) Prepare an analysis of rates for supplying and laying premix asphalt concrete per $m^2$. [7]

   b) Calculate the quantities of material required for following works. [10]

   i) 100$m^2$ cement sand plaster 12mm thick in (1:6)
   ii) 100$m^3$ P.C.C. (1:2:4)

4. a) You have been asked to prepare a valuation report of land for a security of loan. Describe various data which you will collect as a valuation. [5]

   b) A 4 storey building has just completed at a cost of Rs. 40,00,000. The building is constructed on a plot of 19 aana purchased for Rs. 25,00,000 in 2060. The prevailing rate of plots in the locality is Rs. 32,00,000 per ropani. Work out the standard rent per floor per mouth assuming the following outgoings. [10]

   i) Municipal tax 25% of ratable value
   ii) Collection and management charge @ 3% of gross rent
   iii) Repairs at 1% on 9/10$^{th}$ cost of construction
   iv) Sinking fund @ 5% for 65 years on 90% cost of construction
   v) Miscellaneous expenses @ Rs. 500 per month

5. a) Estimate the quantity of earth work for a portion of road, when formation width is 10m. Side slope in cutting and filling are 1:1 and 2:1 respectively. [5]

| | | | |
|---|---|---|---|
| | | | Distance |
| 0m | 30m | 60m | 90m |
| | | | R.L.G |
| 100m | 110m | 111m | 112m |
| | | | R.L.F |
| 100m | upward qrad (1:100) | | |

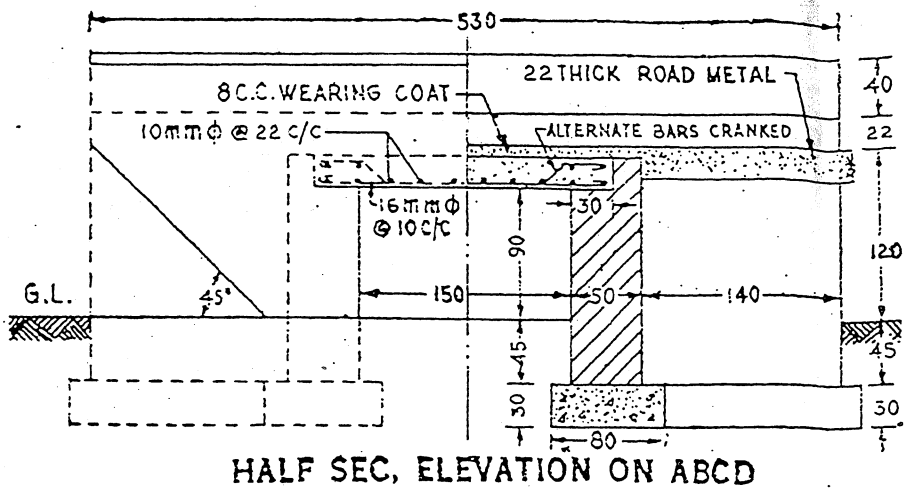
b) Find out the quantity of a hell road when the following data are given: formation width is 10m. Side slope in cutting and filling are (1:1 and 2:1) respectively. [6]

| Chainage | Depth of cutting at centre line | Cross slope of ground |
|---|---|---|
| 0 | 0.5m | 10:1 |
| 30 | 0.30m | 12:1 |
| 60 | 1.00m | 10:1 |

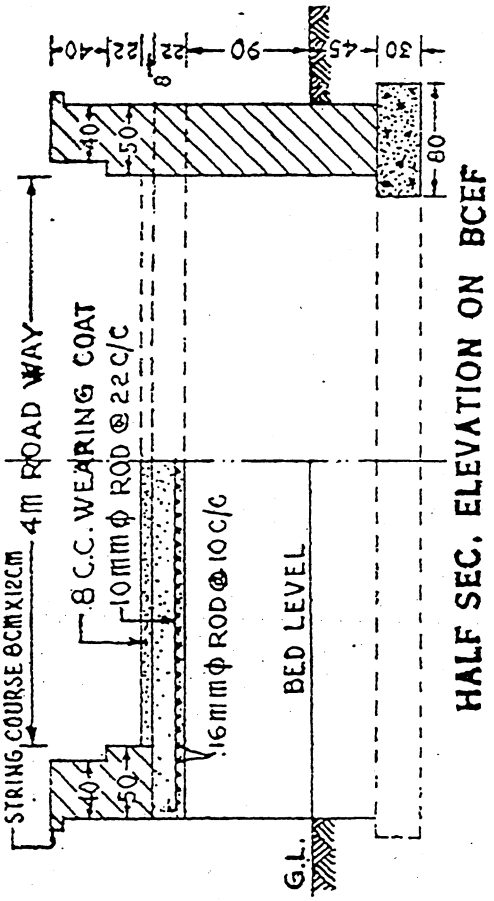
Draw cross section at each point.

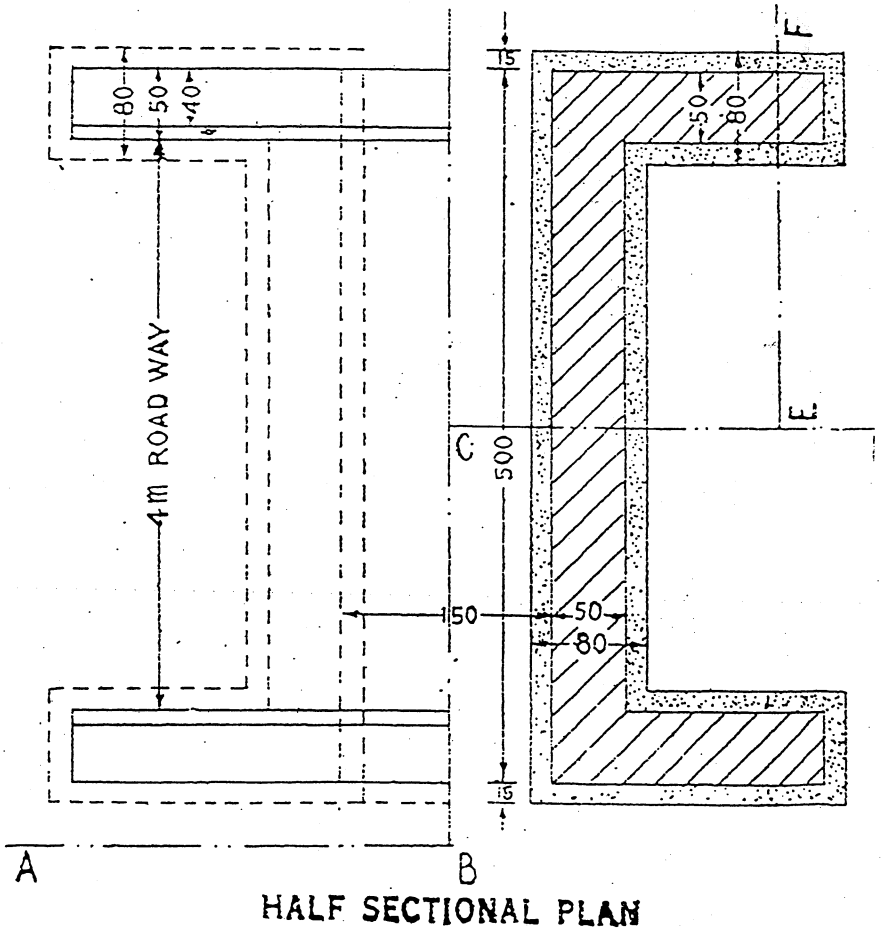
6. Estimate the quantities of the following items of work from the accompanying drawing. [14]
   a) Earthwork in excavation
   b) Cement concrete in foundation
   c) Brick work
   d) RCC work

***




HALF SEC. ELEVATION ON ABCD




HALF SECTIONAL PLAN

All dimensions in centimetre

OG Bhadra
Estimating & Valuation

05 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
# Examination Control Division
2065 Shrawan

| Exam. | Regular/Back | | |
|---|---|---|---|
| Level | BE | Full Marks | 80 |
| Programme | BCE | Pass Marks | 32 |
| Year / Part | IV / I | Time | 3 hrs. |

## *Subject:* - Estimating and Valuation

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary figure is attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. a) What is an estimate, why it should be prepared before construction work? What are the requirements of estimating? [5]

   b) Under what circumstances different types of estimate is prepared? Describe each of them with conditional examples. [5]

2. a) Prepare a preliminary estimate of a two storied VDC's office building to get administrative approval of district development committee having carpet area 500m$^2$. 30% of the built up area is occupies by circulation element and 10% of built up area is occupies by walls. Plinth area rate for civil work is Rs. 10,000 per m$^2$ cost of water supply, sanitary and electrification is 15% of civil cost. Cost of other services is 10% of civil cost. Departmental charge 8% of total cost. [7]

   b) Write short notes on (any three) [3×2]

   i) Contingency
   ii) Bill of quantities
   iii) Distress value
   iv) Depreciation

3. a) Prepare an analysis of rates for doors and window frame per m$^3$. [7]

***OR***

Prepare an analysis of rates for supplying and laying W.C. commode with low level cistern.

b) Calculate the quantities of materials required for [2×5]

i) $10m^3$ Brick masonry in 1:4 cement mortar
ii) $100m^3$ PCC 1:3:6 in foundation.

4. a) Mention various method of valuation and under what circumstances each one is prepared? [5]

b) A 4 story building having a cubic content of $400m^3$ was constructed 25 yrs ago on a freehold land measuring $500m^2$. The building fetches a rent of Rs. 25,000.00 per month. What amount will you recommend for advancing a loan to the owner against mortgage if the rate of land in that area is Rs. 2000.00 per $m^2$. Assume the following outgoing: [10]

i) Municipal and property taxes @ 30% of gross rent.
ii) Collection and management charges @ 3% of the gross rent.
iii) Repairs and maintenance @ 8% of gross rent. Assume the future life to be 65 yrs. Rate of interest as 8% and for redemption of capital 4%.

5. Estimate the quantity of earthwork in cutting and filling from the following data for a portion of road 80m length. [10]

Formation width – 10m
Side slopes in banking 2:1
Side slopes in cutting 1:1

| Chaiange | Depth of cutting at centre line | Height of banking | Cross slope of ground |
|---|---|---|---|
| 0m | 0.60 | — | 10:1 |
| 20m | 0.70 | — | 12:1 |
| 40m | 0.50 | — | 15:1 |
| 60m | | 0.30 | 12:1 |
| 80m | | 0.70 | 10:1 |

6. Estimate the quantities of the following items of work from the accompanying drawing. (Aqueduct) [15]

a) Earthwork in excavation
b) Cement concrete in foundation
c) Brick work
d) RCC work

***