TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Chaitra

Exam.		Regular	
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. 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) 115m^2 of 75mm thick PCC (1:3:6) in floor.
   (ii) 110m^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	
1000	1314.90	1316.00
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

SECTION

REINFORCEMENT –
BEAM — 2½%
SLAB AND POSTS 1%

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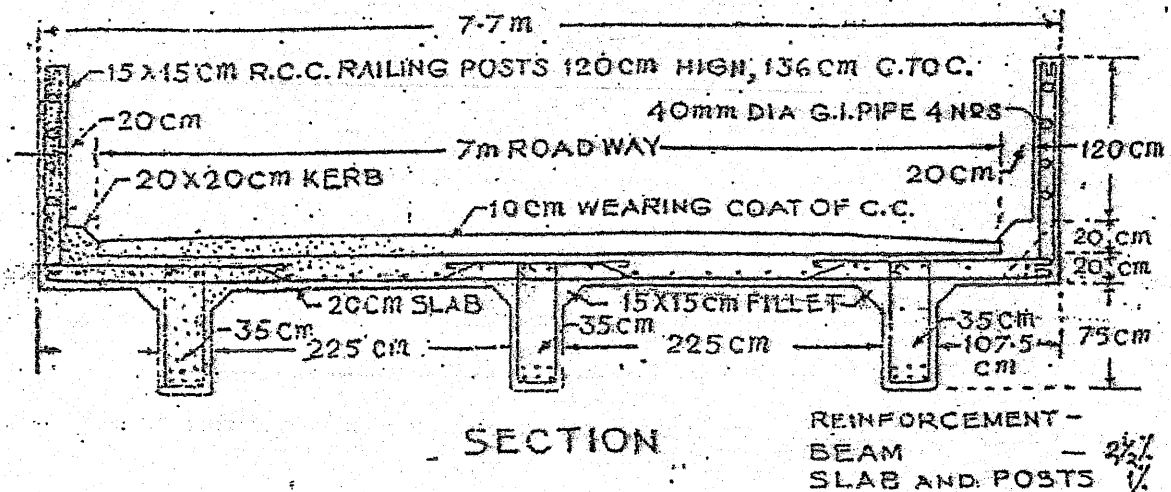
TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Chaitra

Exam.		Regular / Back	
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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. [6]
   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

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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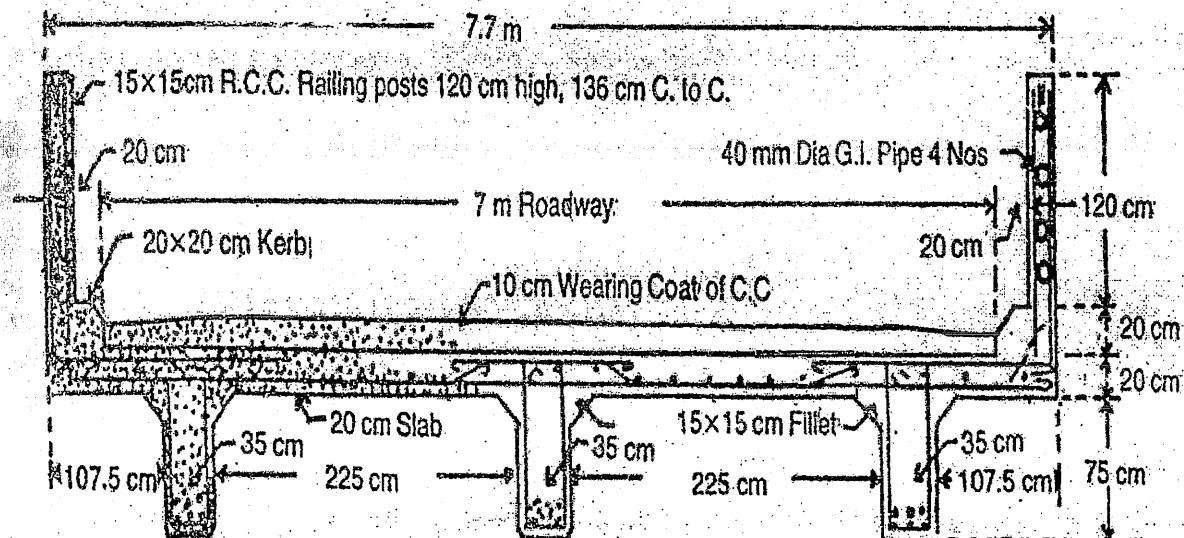
TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Ashwin

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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 m² 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 m²
   (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 m².

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. 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]

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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]

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1. Explain that estimated cost is never the actual cost. Also write principles of unit measurement. [4+2]

2. Explain in brief the various methods of taking out quantities of civil engineering works. Why is a revised estimate required? Explain its reasons. [4+4]

3. What are the types of estimates that are to be prepared for Administrative sanction? [5]

4. a) What are the importances of Analysis of Rates? Explain the factors that affect rate analysis. [2+2]

   b) Prepare Rate analysis of the following as per Norms of Nepal [4+4]

      (i) Ist class Brick in 1:6 C.S mortar in foundation for 1 cum.
      (ii) 20mm thick Bitumen Premix carpeting in a wearing coat of a road for 1 squ.

5. What is project? Discuss estimation of irrigation project. [5]

6. a) Estimate the quantities of following items of work from the accompanying building drawings. [16]

      (i) Earthwork in excavation in foundation.
      (ii) Lime concrete in foundation.
      (iii) First class brickwork in foundation and plinth in cement mortar (1:6)
      (iv) 1st class brickwork in superstructure.

   b) Prepare an estimate for a road portion from the following data.

      - Formation width in Banking = 10m
      - Formation with in cutting = 8m
      - Side slope in cutting = 1:1
      - Side slope in Banking = 2:1 (H:V)

Chainage	0	30	60	90	120	150
Depth of art	0.5	0.3	0.2	-	-	-
Ht.(Height) of Bank	-	-	-	0.3	0.5	0.7
Cross slope of ground	10:1	12:1	14:1	12:1	10:1	8:1

   c) Calculate the quantity of earthwork for portion of channel with following data: [8]

      Bed width = 3m
      Free board = 0.5m
      Side slope for digging = 1:1
      Side slope for banking = 1:1.5
      Full supply depth = 1m
      Top width of bank = 1.5m

Chainage (m)	0	30	60	90
RL of Ground (m)	224.8	224.43	224.12	224.5
Proposed Level (m)	223.94	223.88	223.82	223.76

d) Estimate quantity of following works in RCC T-beam for a bridge of one span of 6m section provided in figure below. Assume 45 cm bearing on either side of abutment. The mild steel section reinforcement are 2.5% in beam and 1% in slab and post. density of mild steel is 78.5 quintal per cu.m (7.85 gm/cm^2)
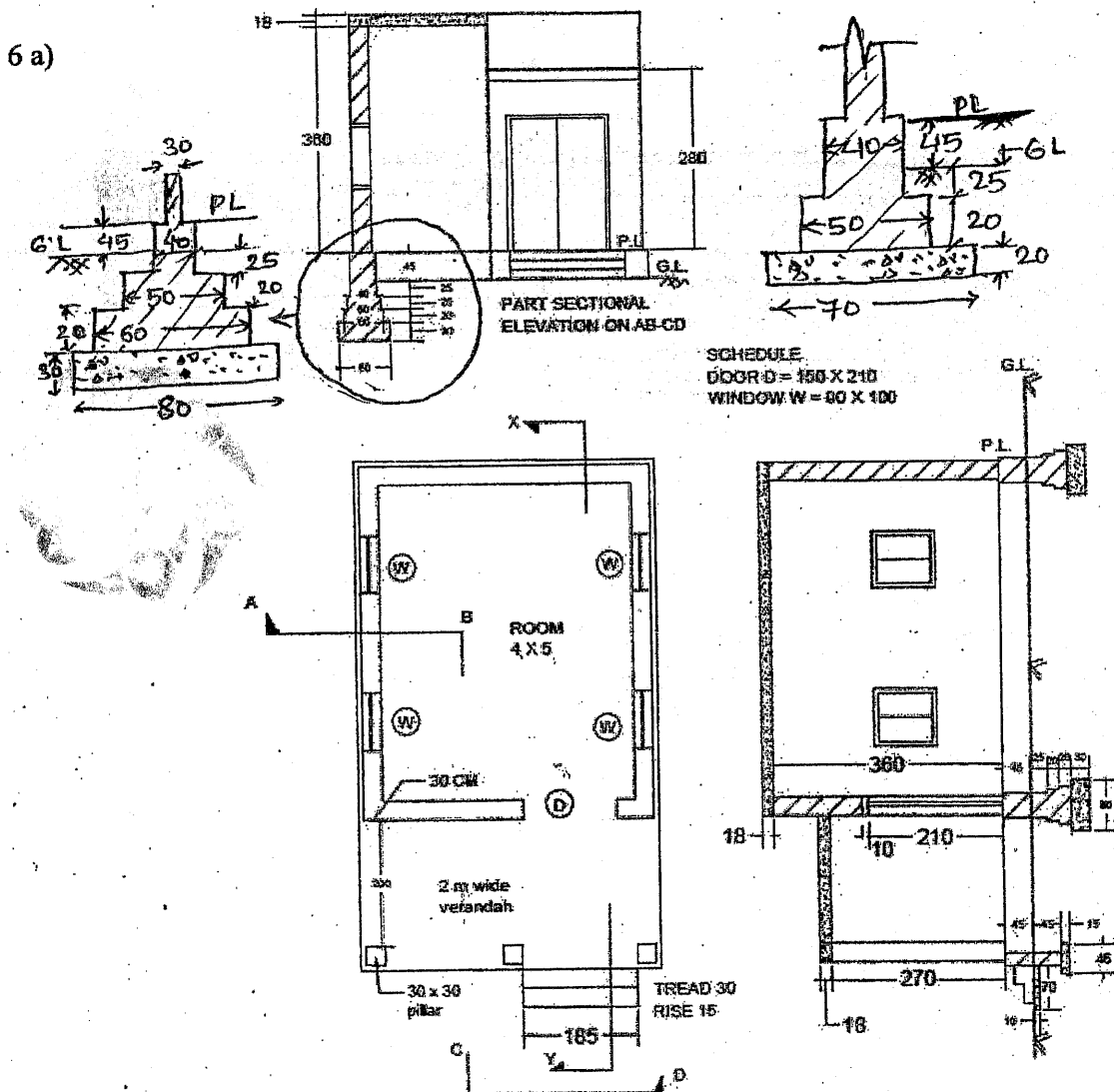
(i) RCC work (1:2:4) for ribs, fillets, deck slab, kerb and wearing coat.
(ii) Steel and GI pipe works

[8]
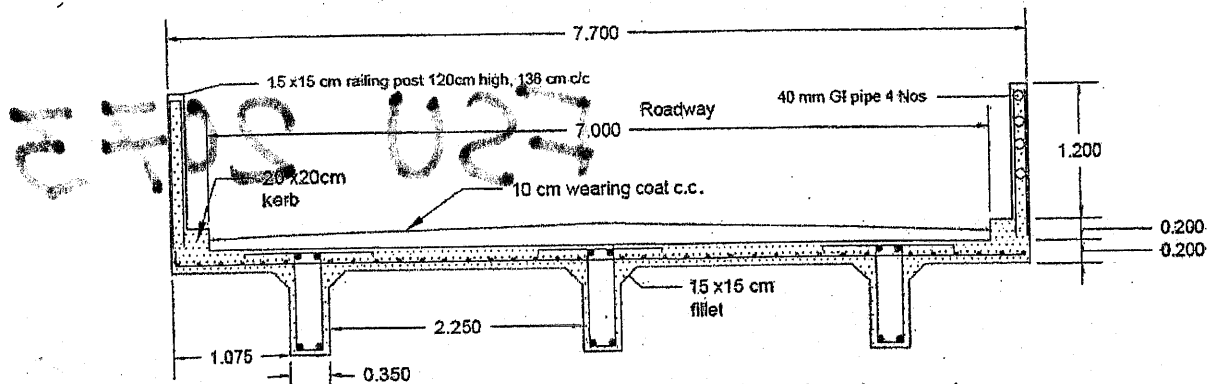
All the dimension are in m. unless otherwise stated.

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6 a)

SCHEDULE
DOOR D = 150 X 210
WINDOW W = 90 X 100

All the dimension are in cm. unless otherwise stated.

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1. 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 |

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1. a) Define Estimate, what are the purposes of preparing estimate? Explain various requirements for preparing detailed estimate. [2+3+3]

   b) What are various methods of taking out quantities of items of works? Explain the importance of abstract of bill of quantities. [4+4]

2. a) What are various types of estimate? Where and when do you require a revised estimate? Explain. [4+4]

   b) Why is Rate analysis necessary in civil engineering works? Prepare rate analysis for the following: [2+3+3]

      i) First class Brick work in 1:6 C.S mortar

      ii) Single coat wearing course surface dressing on top of WBM.

3. a) Mention the various factors included in road project, estimate. [6]

   b) A hill road is to be constructed in a side long ground in cutting. Calculate the quantities of earth work in a length of 200 m from the data given below: [10]

      Formation width of road = 8 m, side slope = 2:1

Distance	Depth of cutting at center	Cross slope of ground
0	0.60 m	8:1
100	1.20 m	10:1
200	1.80 m	12:1

4. a) Work out the quantity of earthwork from 1000 m length of a channel with the following data: [8]

      i) Bed width = 4.0 m
      ii) Proposed bed level at 0 m = 1137.30
      iii) Side slope in cutting = 1:1
      iv) Side slope in banking = 1 ½ :1
      v) Top width of both bank = 1.50 m
      vi) Full supply depth = 60 cm
      vii) Free board = 45 cm
      viii) Bed slope = 1 in 5000
         Ground levels as given below:

Distance	0	500	1000
Ground level	1137.90	1137.80	1137.60
Proposed bed level	1137.30		

   b) Work out the quantities of the following items of work from the accompanying SEPTIK TANK drawing: [8]

      i) Earthwork in Excavation
      ii) PCC (1:3:6)
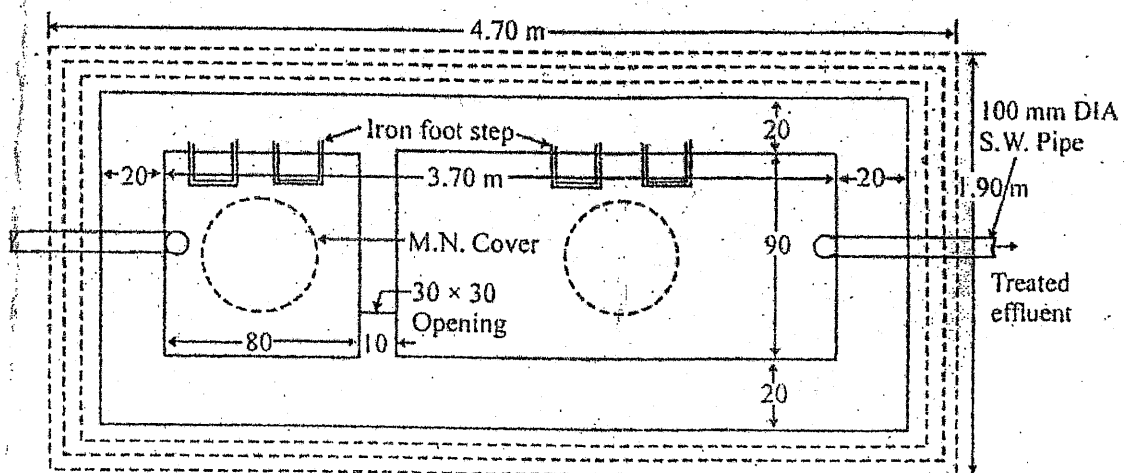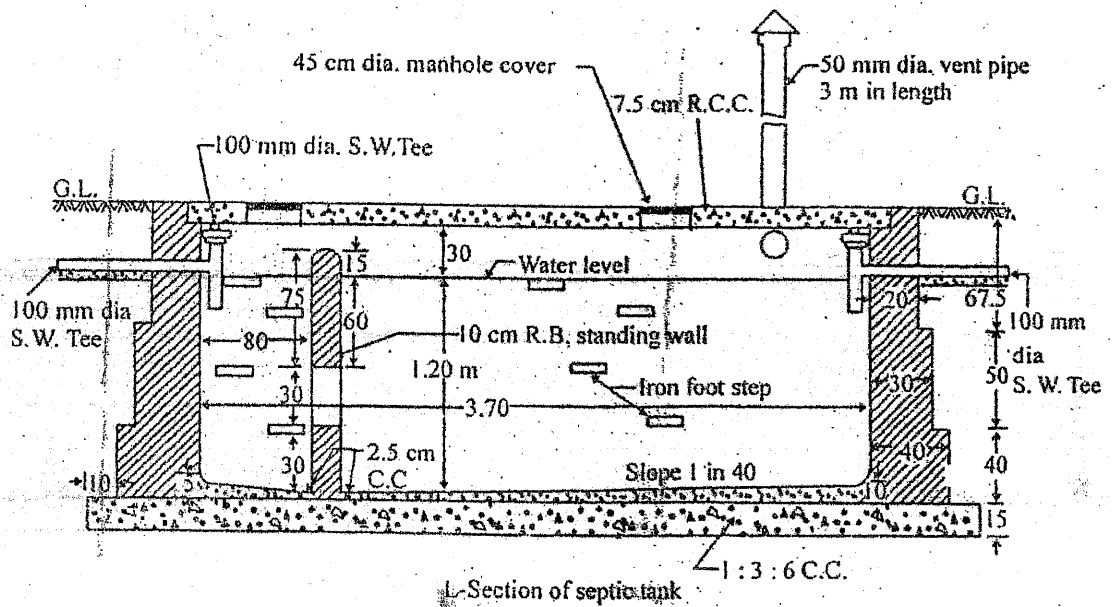   iii) Brickwork in (1:4) cement mortar

5. Calculate the quantity of Earthwork and area of permanent land required for the land acquisition purpose for a portion of a channel from the following data: [12+4]

Bed width= 4 M, Free Board= 45 Cm , Side slope in cutting 1:1, Side slope in Banking= 1 ½ :1
Full supply depth = 1m, Top width of bank= 3 m (Left) 1.5 m Right
There is a 50 cm fall at 60 m distance

Distance	0	30	60	90	120	150
RL of GL	109.80	109.7	109.35	109.30	109.15	109.10
RL of Bed	109.52	Bed slope 1 in 3000				

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For Question No.3(b)

L-Section of septic tank

Plan of septic tank
(All dimensions in cm except otherwise mentioned)

06   TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Shrawan

Exam.		New Back (2066 & Later Batch)	
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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]

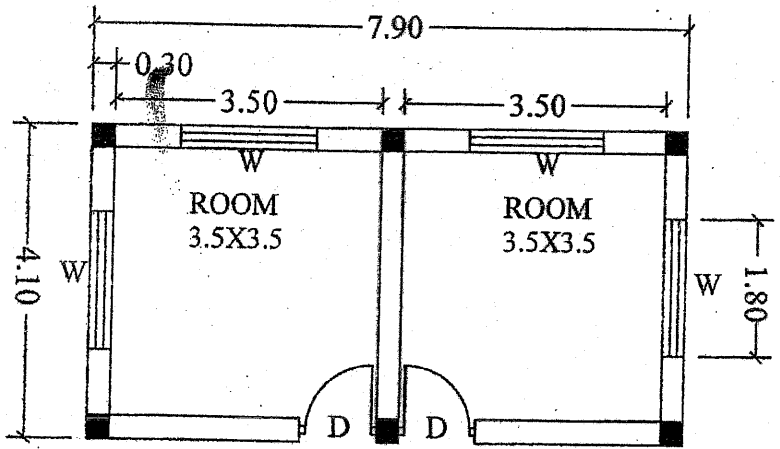   (ii) Prepare bill of quantities from the following data for the construction of RCC T-beam Decking bridge.

Quantity of work	Detail of work	Rate per unit of work
108 m³	PCC (1:1:2) for RCC works	Rs 13,200.00
3240 m²	Formwork for RCC works	Rs 750.00
21600 kg	Steel reinforcement for RCC works	Rs115.00
18 m³	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 10m².

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

7.90

0.30

3.50   3.50

W   W

ROOM
3.5X3.5

ROOM
3.5X3.5

W   W

4.10

1.80

D   D

NOTE

ALL DIMENSION ARE IN METRE

DRAWING IS NOT IN SCALE
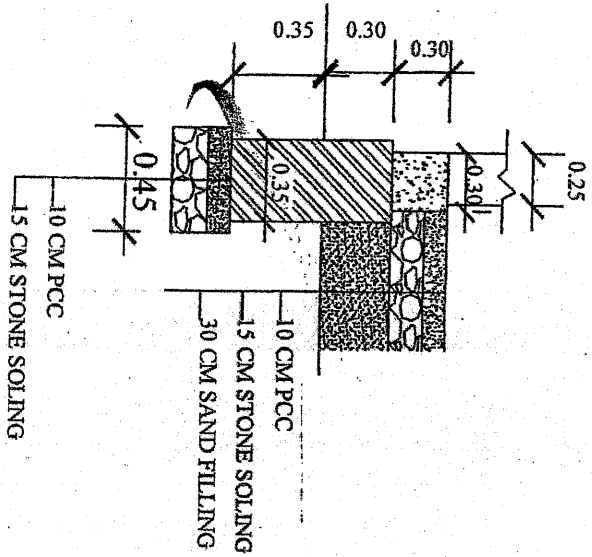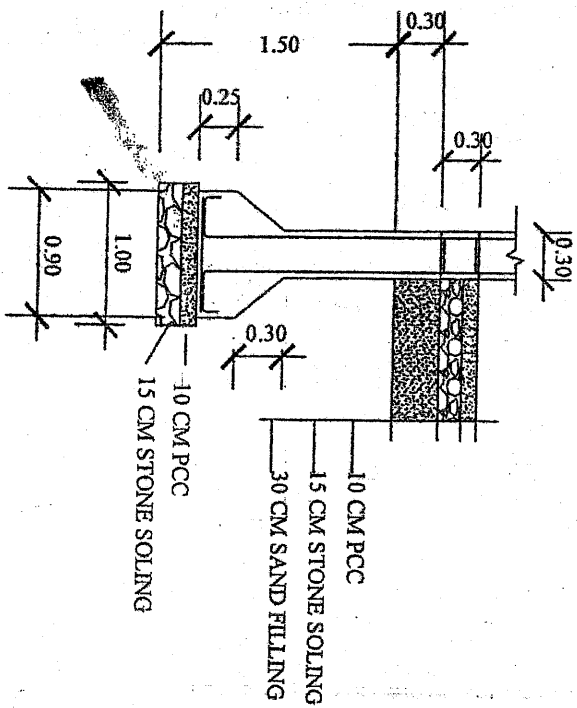
OPENING SCHEDULE

DOOR D-1.0x2.1

WINDOW-1.8x1.5

WALL SECTION

0.35   0.30

0.30

0.45

0.35

0.30

0.25

10 CM PCC

15 CM STONE SOLING

10 CM PCC

15 CM STONE SOLING

30 CM SAND FILLING

SECTION

COLUMN: 0.30x0.30

FOOTING: 0.90x0.90

PLINTH BEAM:0.30x0.30

COLUMN SECTION

0.30

0.90

0.30

1.50

0.25

0.30

0.30

0.90

1.00

0.30

0.30

0.30

10 CM PCC

15 CM STONE SOLING

10 CM PCC

15 CM STONE SOLING

30 CM SAND FILLING

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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]
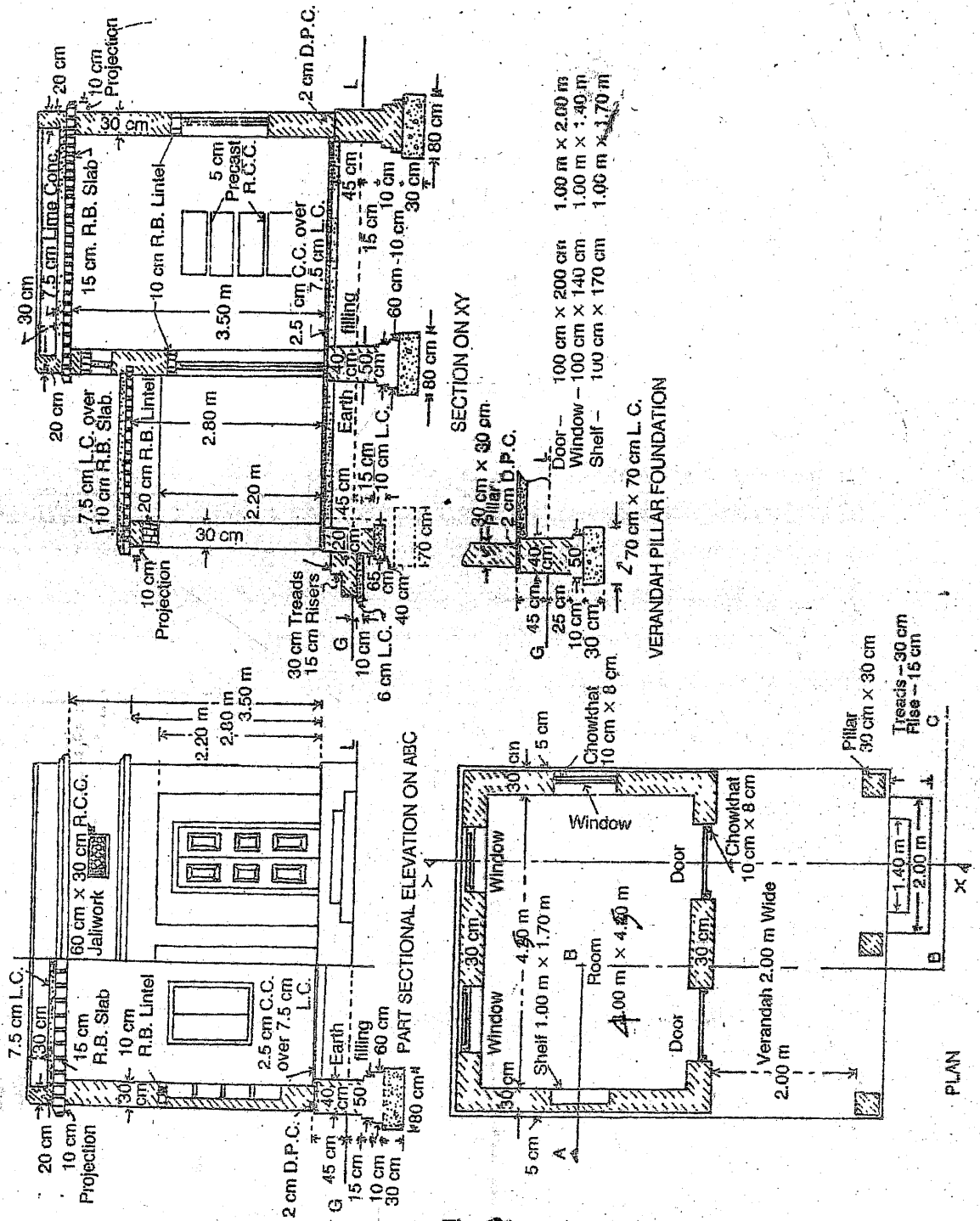
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SINGLE ROOM BUILDING WITH FRONT VERANDAH

Fig.

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) What are the purposes of preparing an estimate of quantities of work and its cost? Explain the data required for preparing an estimate. [4+4]

   b) What are various methods of taking quantities of works? Explain their uses. What do you understand by Bill of Quantities? [4+2]

2. a) What are the components of a complete estimate? When and where are approximate estimate and revised estimate used? [3+3]

   b) What do you mean by Project estimate? How do you write a Project report for a building project? [2+4]

3. a) What is Rate analysis? Write importance of Rate analysis. [3+3]

   b) Prepare Rate analysis for the following items of work: [6+6]

      i) Brick work in (1:6) cement mortar in ground floor level.

      ii) 20 mm thick premix carpeting wearing course

OR

      500 long WC. Pan with low level cistern per-no.

4. Prepare detailed estimate of the following items of work for a building from the attached drawing: [12]

   i) Earthwork in excavation in foundation

   ii) Lime concrete in foundation

   iii) Brick work in 1:6 cement sand mortar in formation up to plinth

5. Calculate earthwork for a portion of hill road from the following data: [12]

Chainage	0 m	30 m	60 m	90 m
RL of GL	104.0 m	105.0 m	106.0 m	107.0 m
Formation level	105.0 m	105.5 m	106.0 m	106.5 m
Transverse / cross slope of ground	20:1	15:1	12:1	10:1

Formation width = 10 m, side slope in cutting = 1:1

Side slope in banking = (2:1) (H:V)

6. Prepare detailed estimate for the following items of work from the given drawing of septic tank and soak pit. [4+4+4]

   i) Earthwork in excavation in septic tank and soak pit

   ii) Plain cement concrete (1:3:6) in foundation

   iii) Brick work in (1:6) cement mortar in septic tank and soak pit
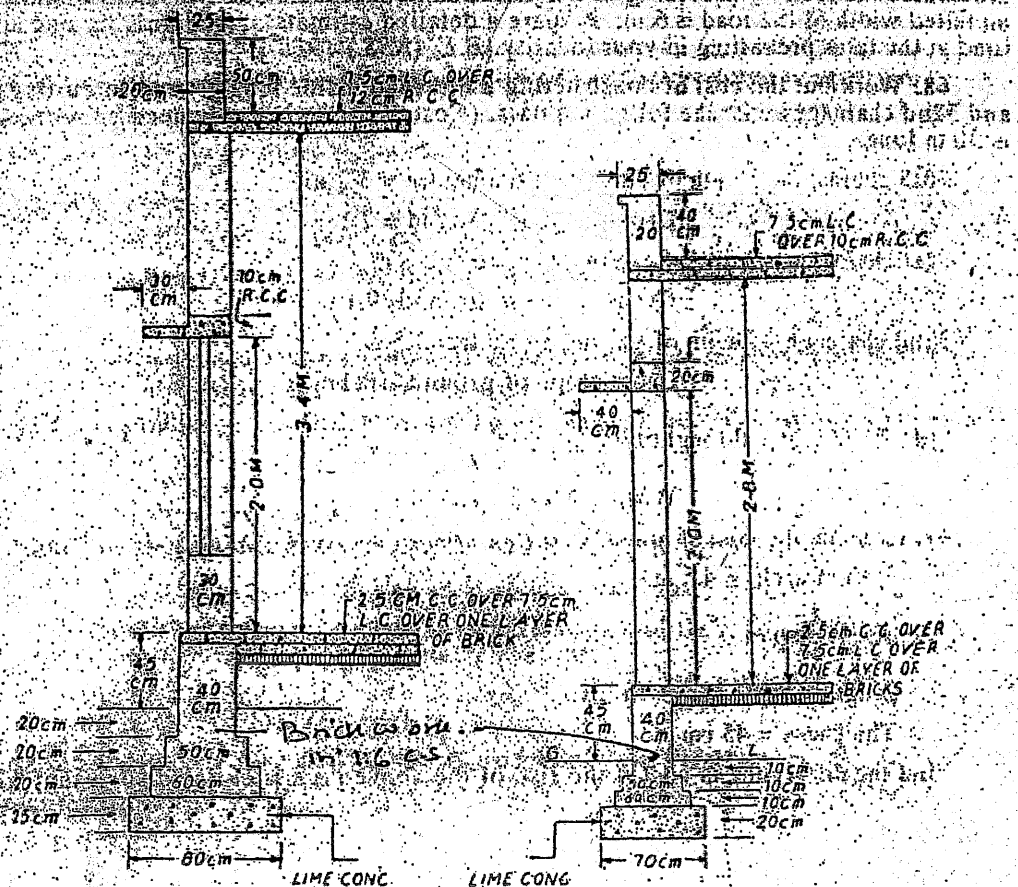
***

PLAN

ROOM
5.0M X 4.0M

ROOM
4.0M X 6.7M

VER 2.5M
WIDE

30 cm · W · —4.0M— · W · 30 · W · 5.0M · W · 30

4.0M

2.5M

4.20M

PLAN DOORS 1.0 X 2.0M WINDOWS 1.0 X 1.5M

25
50cm
20cm
7.5cm L.C. OVER
12cm R.C.C.

10cm
10cm R.C.C.

3.4M

2.0M

50 cm

2.5 CM C.C. OVER 7.5cm
L.C. OVER ONE LAYER
OF BRICK

40 cm

20cm
20cm
20cm
15cm

50cm
60cm

Brick work
in C.C.s

80cm

LIME CONC.

**SECTION MAIN
ROOM WALL**

25
40 cm
20
7.5cm L.C.
OVER 10cm R.C.C.

20cm

40 cm

2.8M

2.0M

2.5cm C.C. OVER
7.5cm L.C OVER
ONE LAYER OF
BRICKS

45 cm
40 cm

50cm
60cm

10cm
10cm
10cm
20cm

70cm

LIME CONC

SEC VER WALL

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Examination Control Division
2071 Shawan

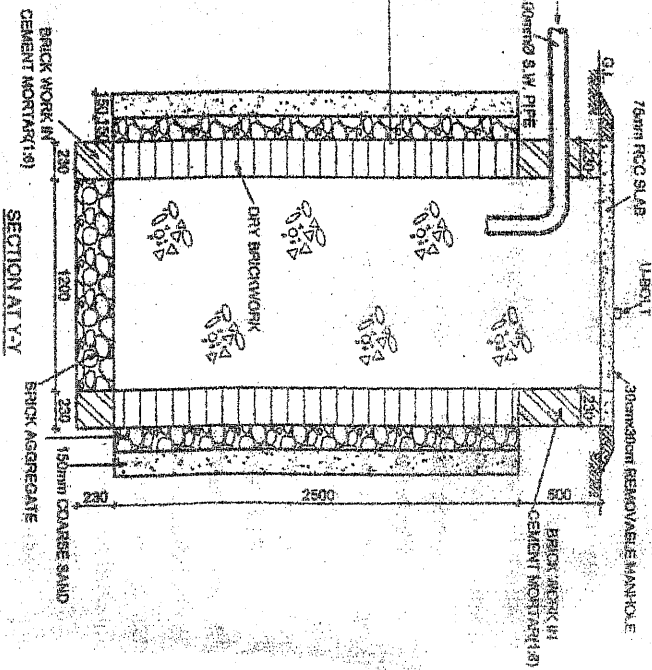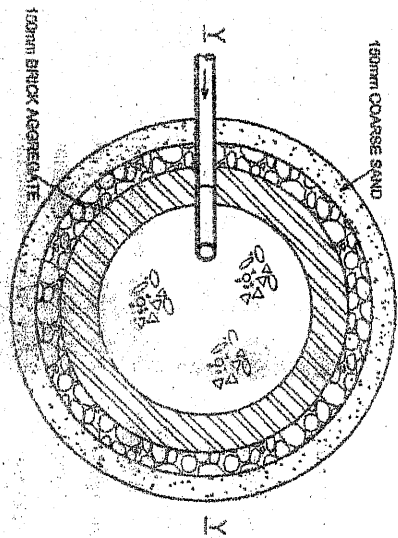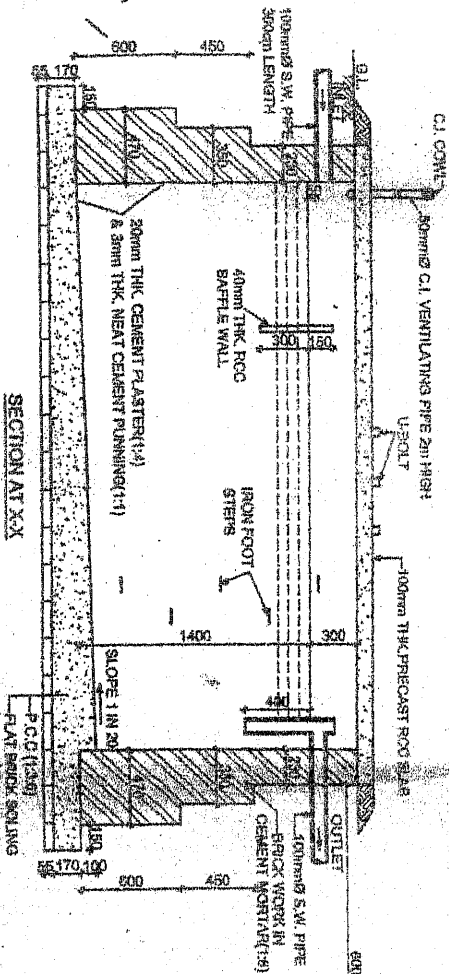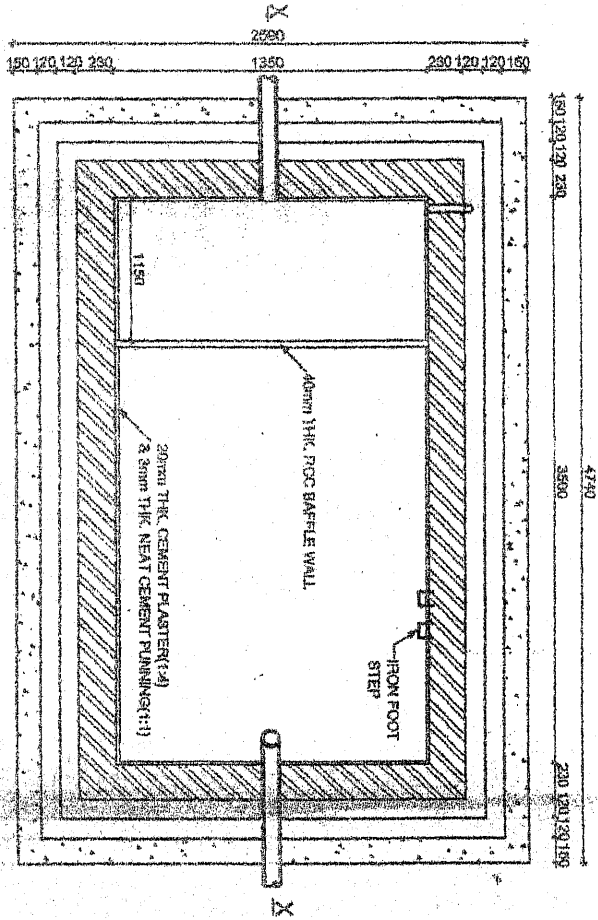| Exam.	**New Back (2066 & Later Batch)**		
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

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) Define estimate and write its purpose. [5]

   b) What are the various methods of taking out qualities? Explain with figure. [6]

   c) What are the units of measurements and payments of the following items? [5]

      i) Earth work in excavation

      ii) Woodwork in door and window shutters

      iii) W.C pan

      iv) Reinforcement work

      v) White washing

2. a) What is analysis of rates? Write the requirements of rate analysis. [5]

   b) Prepare the analysis of rates for 12 mm thick 1:4 cement plastering on ceiling per 10 m². [5]

   c) Find the quality of materials required for first class B/W in 1: 4 cement sand mortar per 150m³. (Assume size of brick = 230×110×57 mm and thickness of motor is 12mm) [6]

3. a) What are the different types of estimate and in which conditions they are used? [7]

   b) Calculate the volume of earthwork in the hill road having formation width of road is 10 m from the following data: [9]

Distance (m)	Depth of cut(m)	Ht.of fill(m)	Cross Slope	Remarks
0	0.90	-	10:1	Side slope:
100	-	1.20	6:1	Cutting = 1:1
200	-	0.50	5:1	Filling = 2:1

4. a) What are the things that should be considered for preparing project estimate report of an irrigation project? [8]

   b) What are the difference between (i) contingencies and overhead costs. (ii) Bill of quantities and Abstract of cost. [8]

5. Estimate the following items of work from the attached drawing provided behind this page: [4×4]

   i) Earth work in excavation in septic tank and soak pit

   ii) Brick work in 1:6 cement sand mortar

   iii) Dry brick work

   iv) Brick aggregate filling

***

SEPTIC TANK PLAN

2580
150 120 120 230 | 1350 | 230 120 120 160
4740
3500

150 120 120 230

1150

40mm THK. RCC BAFFLE WALL

20mm THK. CEMENT PLASTER(1:4) & 3mm THK. NEAT CEMENT PUNNING(1:1)

IRON FOOT STEP

230 120 120 150

X — X

SECTION AT XX

600 | 450
170
20mm THK. CEMENT PLASTER(1:4) & 3mm THK. NEAT CEMENT PUNNING(1:1)
100mmØ S.W. PIPE 350cm LENGTH
C.I. COWL
50mmØ C.I. VENTILATING PIPE 2m HIGH
40mm THK. RCC BAFFLE WALL
300 150
U-BOLT
100mm THK PRECAST RCC SLAB
IRON FOOT STEPS
1400 | 300
400
SLOPE 1 IN 20
OUTLET
100mmØ S.W. PIPE
BRICK WORK IN CEMENT MORTAR(1:6)
P.C.C (1:3:6)
FLAT BRICK SOLING
170 190
600 | 450

SECTION AT Y-Y

150mmØ S.W. PIPE
G.L.
75mm RCC SLAB
BRICK WORK IN CEMENT MORTAR(1:6)
DRY BRICKWORK
U-BOLT
BRICK AGGREGATE
150mm COARSE SAND
30cm×30cm REMOVABLE MANHOLE
BRICK WORK IN CEMENT MORTAR(1:6)
230 | 1200 | 230
230 | 2500 | 500

SOAK PIT PLAN

Y — Y
150mm BRICK AGGREGATE
150mm COARSE SAND
180 450 230
1200
230 450 180

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.
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✓ 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

50mmx100mm String Course

AV. 10cm L.C. (2:2:7) over 10cm R.C.C. SLAB

15cm R.C.C. Band Lintel

2.7M

2.5cm DPC

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

25mm C.C. Floor
75mm L.C. over B.F.S.

PLAN

W   30cm   W   W   W

14.5M   4.0M   R.C.C. Beam 20x15cm WEB

ROOM 4.5M×3.6M   ROOM 4.0M×3.6M

C   D   D

30cm   30cm   30cm

20cm×20cm PILLAR

STEPS
Tread – 30cm
Rise – 15cm

A   2.4M   B

SECTION ON PQ

60cm   45cm

2.7M   3.6M

20cm×20cm PILLAR

P.L.

15cm C. Conc.   60cm G.L.
40cm
20cm
30cm
70cm

R. C. C. T-BEAM DECKING

7.7m

15x15cm R.C.C. RAILING POSTS 120cm HIGH, 136cm C.TO C.

20 cm   40mm DIA G.I.PIPE 4 NOS

7m ROAD WAY   120 cm

20×20cm KERB   20cm

10cm WEARING COAT OF C.C.

20cm
20cm

20CM SLAB   15X15cm FILLET

35 Cm   35cm   35Cm
107.5 cm   225 cm   225 cm   107.5 cm   75cm

SECTION

REINFORCEMENT –
BEAM   – 2½%
SLAB AND POSTS. 1%

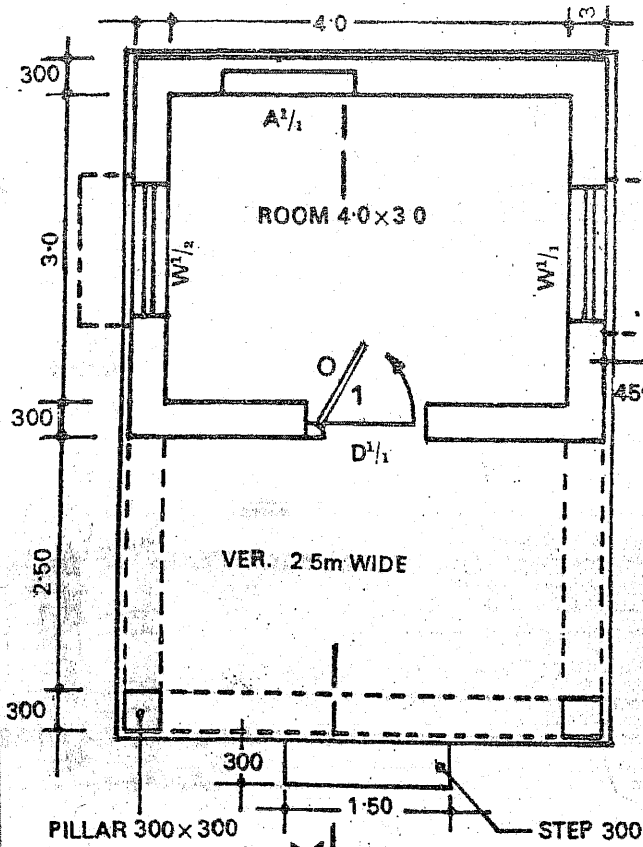| Exam.		Regular	
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

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 is an estimate? Briefly describe the data required for preparation of an estimate.   [2+3]

   b) What is a detailed estimate? When and where the following estimates are prepared?   [2+2+2]
      i)   Revised estimate
      ii) Cube rate estimate

2. a) What do you understand by contigencies? How the following items of work are measured? Write with units of measurement and payments.   [2+2+2]
      i)   Damp proof course
      ii) Bending and binding of reinforcement

   b) Explain two popular methods to calculate quantities of a building.   [4]

3. a) Why is rate analysis prepared? Prepare an analysis of rate for PCC (1:2:4) for RCC work in a floor slab.   [2+6]

   b) Calculate the quantities of materials required for the following item of works.   [4+4]
      i)   500 sq.m.15mm thick Cement sand plastering (1:4) in wall
      ii) 20 cu.m. of brick work in cement sand mortar (1:5) in foundation (Assume size of brick 240×120×60 mm and 12 mm thickness of mortar joint)

4. Write short notes on: (any two)   [4+4]
   i)   Small water supply project estimate
   ii) Importance of rate analysis and requirements for rate analysis
   iii) Bill of quantities

5. Calculate the quantities of the following items of work from the attached building drawing No.1.   [4+4+2+2]
   i)   Earth work in excavation in foundation
   ii) Brick work in cement mortar (1:4) in foundation and plinth
   iii) Wood work in door shutters
   iv) PCC in foundation

6. Estimate the quantities required for PCC in foundation and brick work as shown in attached drawing No.2 of slab culvert.   [4+6]

7. a) Prepare an estimate of a Earthwork in cutting and filling of a portion of a road from the given data: [8]
      Road width : 10 m
      Side slopes in cutting 1.5:1 and in banking 2:1
      Downward grading 1 in 150

Chainage / Distance	0	30	60	90m
Ground level (m).	102	104	103	99
Formation level (m).	100			

   b) Write down the formula for calculates of cross sectional area and area of permanent land for a portion of an irrigation canal in full embankment with clear sketch.   [5]
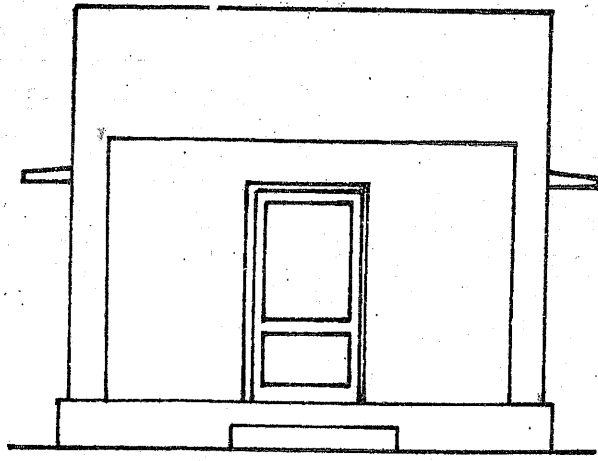
OR

Calculate the quantities of earth work and brick work of a soak pit with 1.5 m external diameter, 20 cm wall thickness and 3.5 m depth from ground level.
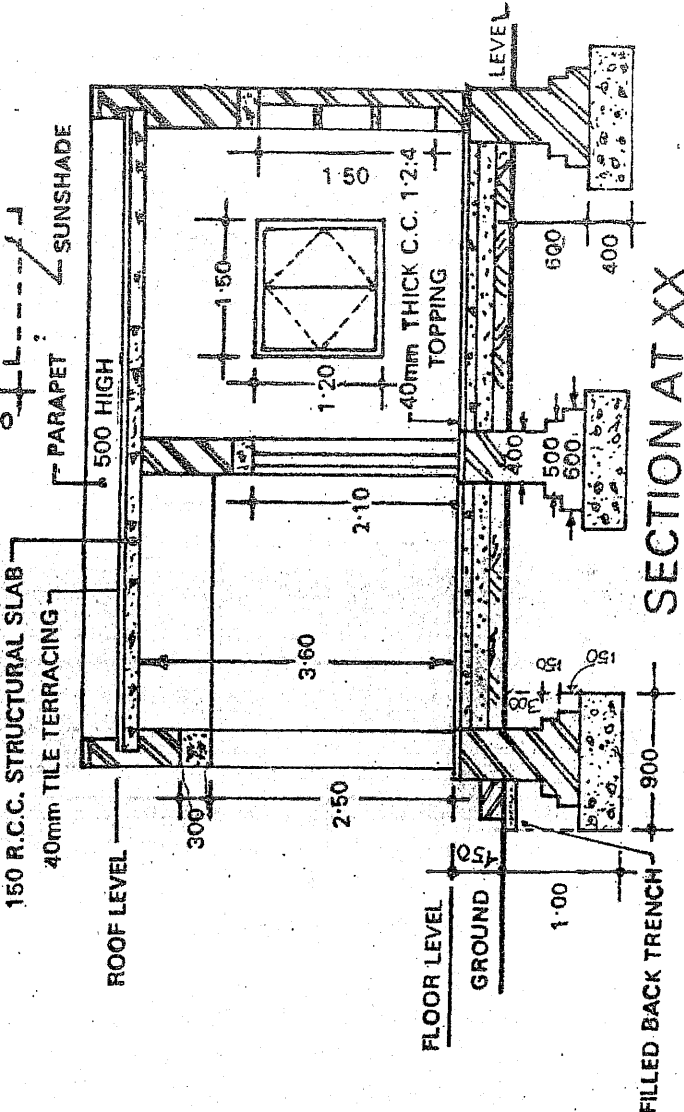
***

PLAN
SCALE 1:75

- 4·0
- 3
- 300
- A¹/₁
- ROOM 4·0 × 3·0
- W¹/₂
- W¹/₁
- 3·0
- O 1
- D¹/₁
- 450
- 300
- VER. 2·5m WIDE
- 2·50
- 300
- 300
- 1·50
- PILLAR 300 × 300
- STEP 300
- ×L

SECTION AT XX

- LEVEL
- SUNSHADE
- 1·50
- 1·50
- 40mm THICK C.C. 1:2·4 TOPPING
- 1·20
- 600
- 400
- PARAPET
- 500 HIGH
- 150 R.C.C. STRUCTURAL SLAB
- 40mm TILE TERRACING
- 2·10
- 400
- 500
- 600
- 3·60
- 150
- 150
- 100
- 300
- ROOF LEVEL
- 300
- 2·50
- 2·50
- 150
- 450
- FLOOR LEVEL
- GROUND
- 1·00
- 900
- FILLED BACK TRENCH

ELEVATION
SCALE 1:75

REFERENCE

S.NO.	SIZE	DESIGNATION	NUMBERING
1.	1·10 × 2·10	11 DS 21	D¹/₁
2.	1·50 × 1·20	15 WT 12	W¹/₁ W¹/₂
3.	1·5 × 1·5	15 AT 15	A¹/₁

Drawing NO 1.

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) Define Estimate. Explain how you prepare preliminary estimate of a building project for the administrative approval. [2+5]

   b) What are the types of estimates? Explain with conditions when they are used. [9]

2. a) Discuss briefly the factors which affect the unit price of an item of work. [4]

   b) Work out the number of bricks, cement and sand required for 115m³ of brick masonry in (1:3) cement mortar in superstructure. The size of brick is 240×120×60mm and the thickness of mortar joint is 12mm. [4]

   c) Prepare an analysis of rate for 50mm thick PCC (1:1 ½:3) in floor. [4]

   d) Prepare an analysis of rate for W.C. commode with low level cistern [4]

3. a) Estimate the quantity of earthwork between 20m chainage and 100m chainage at equal interval of 20m. (Plain road) [8]

Distance in chainage (m)	20m	40m	60m	80m	100m	120m	140m
RL of ground(m)	77.74	77.80	78.20 80.40	80.25	80.00	79.60	79.80

   Formation level at 20m chainage is 78.70m.
   Formation width of the road = 12m
   Side slope in cutting = 1:1
   Side slope in filling = 2:1
   Formation has a rising gradient of 1 in 100.

   b) A road is to be constructed in hilly area with formation width of 10m, side slope in banking 2:1 and cutting 1:1. The height of banking and depth of cutting at center line of the road is given below. The cross slopes of the ground are also given at different sections. Calculate the quantities of earth work. [8]

Chainage/distance	cutting	filling	Cross slopes of ground
0	0.60	-	10:1
30	-	0.40	15:1
60	-	0.60	12:1

4. a) Estimate the quantities of the following items of work from the accompanying building drawing. (assume missing data) [8]
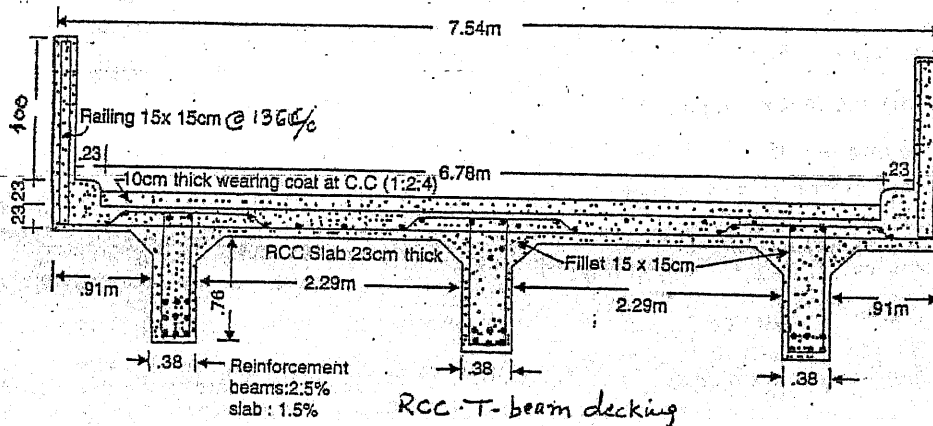
    i) Earth work in excavation
    ii) RCC work
    iii) Brick work in foundation and plinth
    iv) Wood work for doors and window frame.

   b) Estimate the quantity of the following item of work from the accompanying RCC T-beam decking beam for a bridge of one span of 6.50 metre. The bearing of the beams on either side of the abutment = 50cm. The steel reinforcement in beam may be assumed as 2.50 percent and in the slab, Post, fillet, kerb as 1.50 percent of the volume of PCC. [8]

    i) PCC M20 (1:1½:3) for RCC works.
    ii) Steel reinforcement

RCC T-beam decking

5. a) A 25 years old property is fetching an annual rent of Rs.1,45,000/-. The life of the building was expected to be 70 years. The rate for interest for sinking fund is 5% and that for capitalization is 7%. The estimated cost of land at present is Rs.25,00,000/- and at the end of life of building, its scrap value will be Rs.5,00 000/-. The owner is paying the other expenses annually at 35% of income. Determine the value of the property. [8]

   b) Write short notes on: (any two) [4+4]

    i) Sinking fund
    ii) Capitalized value
    iii) Salvage value

***

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 $240 \times 130 \times 65mm$ 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

***

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

Subject: - Estimating and Valuation

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✓ **Necessary figures are attached herewith.**
✓ Assume suitable data if necessary.

1. a) Define Estimate. Explain how you prepare preliminary estimate of a building project for the administrative approval. [2+5]

   b) What are the types of estimates? Explain with conditions when they are used. [9]

2. a) Discuss briefly the factors which affect the unit price of an item of work. [4]

   b) Work out the number of bricks, cement and sand required for 115m³ of brick masonry in (1:3) cement mortar in superstructure. The size of brick is 240×120×60mm and the thickness of mortar joint is 12mm. [4]

   c) Prepare an analysis of rate for 50mm thick PCC (1:1 ½:3) in floor. [4]

   d) Prepare an analysis of rate for W.C. commode with low level cistern [4]

3. a) Estimate the quantity of earthwork between 20m chainage and 100m chainage at equal interval of 20m. (Plain road) [8]

Distance in chainage (m)	20m	40m	60m	80m	100m	120m	140m
RL of ground(m)	77.74	77.80	78.20 80.40	80.25	80.00	79.60	79.80

   Formation level at 20m chainage is 78.70m.
   Formation width of the road = 12m
   Side slope in cutting = 1:1
   Side slope in filling = 2:1
   Formation has a rising gradient of 1 in 100.

   b) A road is to be constructed in hilly area with formation width of 10m, side slope in banking 2:1 and cutting 1:1. The height of banking and depth of cutting at center line of the road is given below. The cross slopes of the ground are also given at different sections. Calculate the quantities of earth work. [8]

Chainage/distance	cutting	filling	Cross slopes of ground
0	0.60	-	10:1
30	-	0.40	15:1
60	-	0.60	12:1

4. a) Estimate the quantities of the following items of work from the accompanying building drawing. (assume missing data) [8]
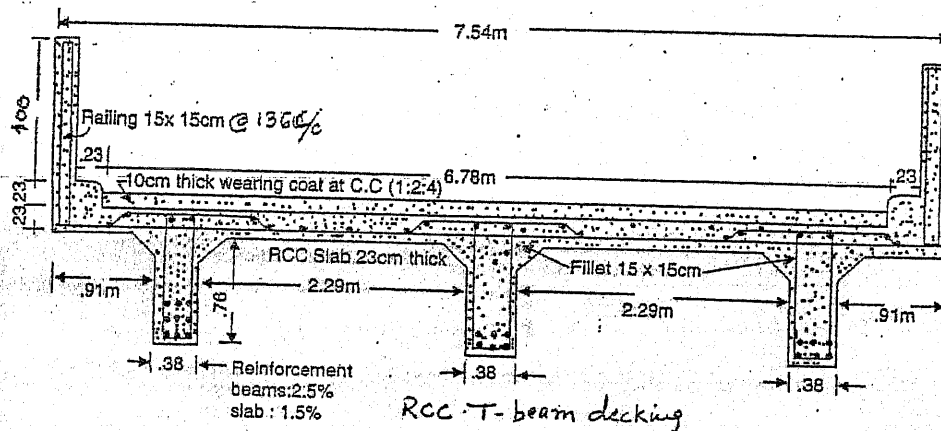
   i) Earth work in excavation
   ii) RCC work
   iii) Brick work in foundation and plinth
   iv) Wood work for doors and window frame.

   b) Estimate the quantity of the following item of work from the accompanying RCC T-beam decking beam for a bridge of one span of 6.50 metre. The bearing of the beams on either side of the abutment = 50cm. The steel reinforcement in beam may be assumed as 2.50 percent and in the slab, Post, fillet, kerb as 1.50 percent of the volume of PCC. [8]

   i) PCC M20 (1:1½:3) for RCC works.
   ii) Steel reinforcement

RCC T-beam decking

5. a) A 25 years old property is fetching an annual rent of Rs.1,45,000/-. The life of the building was expected to be 70 years. The rate for interest for sinking fund is 5% and that for capitalization is 7%. The estimated cost of land at present is Rs.25,00,000/- and at the end of life of building, its scrap value will be Rs.5,00 000/-. The owner is paying the other expenses annually at 35% of income. Determine the value of the property. [8]

   b) Write short notes on: (any two) [4+4]

   i) Sinking fund
   ii) Capitalized value
   iii) Salvage value

***

Subject: - Estimating and Valuation

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✓ Attempt __All__ questions.
✓ The figures in the margin indicate __Full Marks__.
✓ __Necessary figures are attached herewith.__
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1.   a. Explain methods of measurement of earthwork. (4)
     b. What are the methods of estimate? Work out plinth area estimate of a building. (4)
2.   Workout Simpson's one-third rule to calculate area of cross-section of a road. (6)
     The following are the cross-sections of a portion of a road: (6+4)
     Chainage: 500m

Distance, m:	0	5	10	15	20	25	30
Depth, m:	1.5	2.1	3.0	3.6	4.5	3.9	1.5

Chainage: 550m

Distance, m:	0	5	10	15	20	25	30
Depth, m:	3.5	4.1	2.0	3.6	4.5	2.9	3.5

Chainage: 600 m

Distance, m:	0	5	10	15	20	25	30
Depth, m:	2.5	3.1	3.0	4.6	2.5	2.9	4.5

   a. Calculate area of cross-section of each chainage by trapezoidal method.
   b. Calculate earthwork from ch.500 to 600 by using prismoidal formula.
3.   Calculate materials required for 10 m^3 brick masonry in cement mortar 1:6 ratio and workout analysis of rate. Assume brick size of 230x110x55mm and mortar thickness of 10mm. (8+8)
4.   Prepare a detailed measurement and abstract of quantities of the following items of work of a given building drawing: (4+8+8+4)
   a. Brick work in cement mortar in 1:8 up to plinth.
   b. Brick work in cement mortar in 1:6 in super structure.
   c. RCC work in Roof, and length of ridges
   d. Sal wood works in doors, windows and ventilators frames.
5.   a. Explain purpose of valuation. (6)
     b. A building is situated by the side of a road of Maharajgunj of Kathmandu city on a land of 545 sq. m. The built up area is 16mx18m. The building is two storage with combination of load bearing and framed structure, and provided with the first class sanitary and electrical fittings with water supply system. The age of building is 22 years. Work out the valuation of the property.
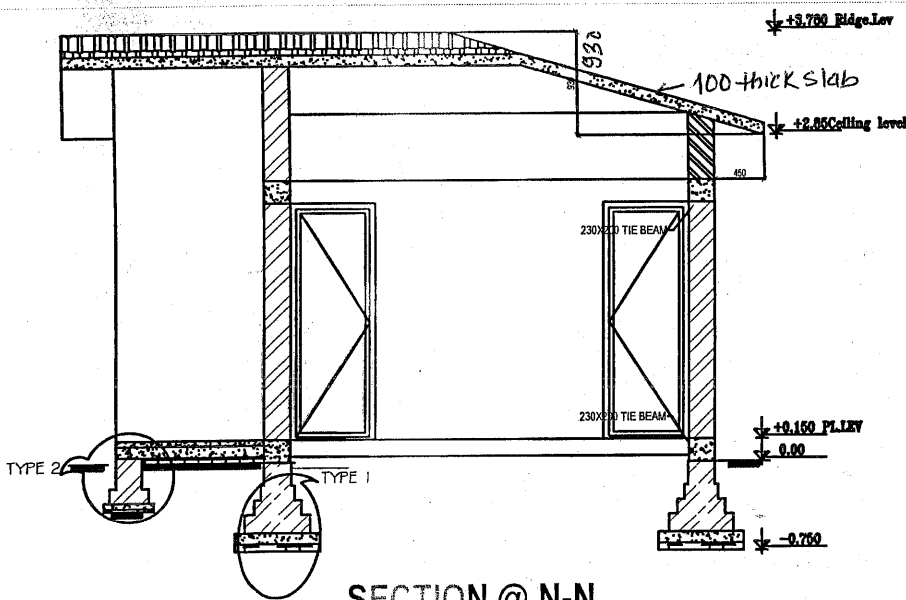
     Assume the prevailing rate of land is Rs. 50,000 per sq.m plinth area rate of building is Rs. 15,000 per sq.m and the life of building is 60 years. (10)
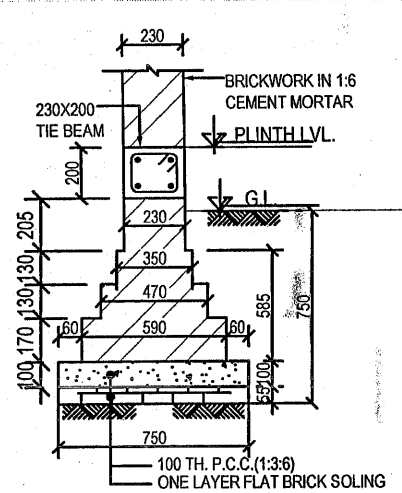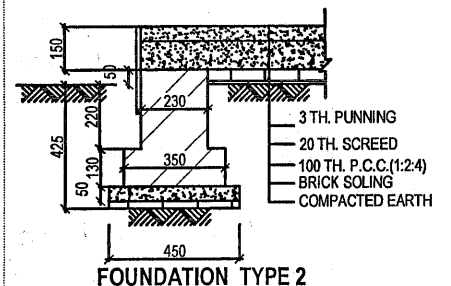
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BUILDING PLAN

STORE D2

230
1500
230 1000 230 3000 230
230
120 110
3530

GUARDS' ROOM

1800 TOILET
D2
D2 230 W
D2 110 D1
1200 KITCHEN 1310 VERANDAH
2300
230
W
N

ROOF PLAN

450
45'0'0"
Slope Slope
450

SECTION @ N-N

+3.780 Ridge.lev
930
100 thick slab
+2.85 Ceiling level
450
230X230 TIE BEAM
230X230 TIE BEAM
+0.150 PL.LEV
0.00
TYPE 2
TYPE 1
−0.750

FOUNDATION TYPE 1

230
BRICKWORK IN 1:6
CEMENT MORTAR
230X200
TIE BEAM
PLINTH LVL.
200
G.L
205
230
130 130
350
470
170
100 60 590 60
585
750
550
750
100 TH. P.C.C.(1:3:6)
ONE LAYER FLAT BRICK SOLING

FOUNDATION TYPE 2

150
50
230
425 220
3 TH. PUNNING
20 TH. SCREED
130 350
100 TH. P.C.C.(1:2:4)
BRICK SOLING
50 130
COMPACTED EARTH
450

Doors amd windows Schedule

D1 900 x 2100 mm
D2 750 x 2100 mm
W 1200 x 1500 mm
V 600 x 450 m
Frame size 75 x 100 mm

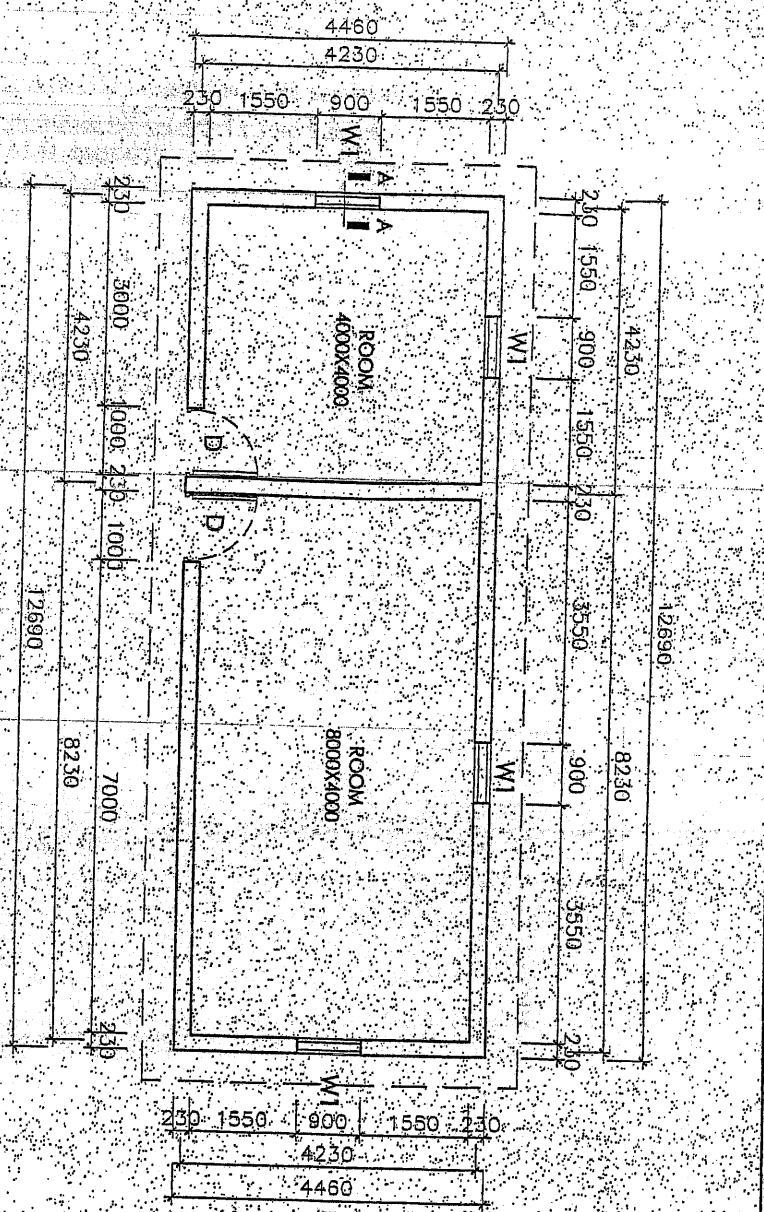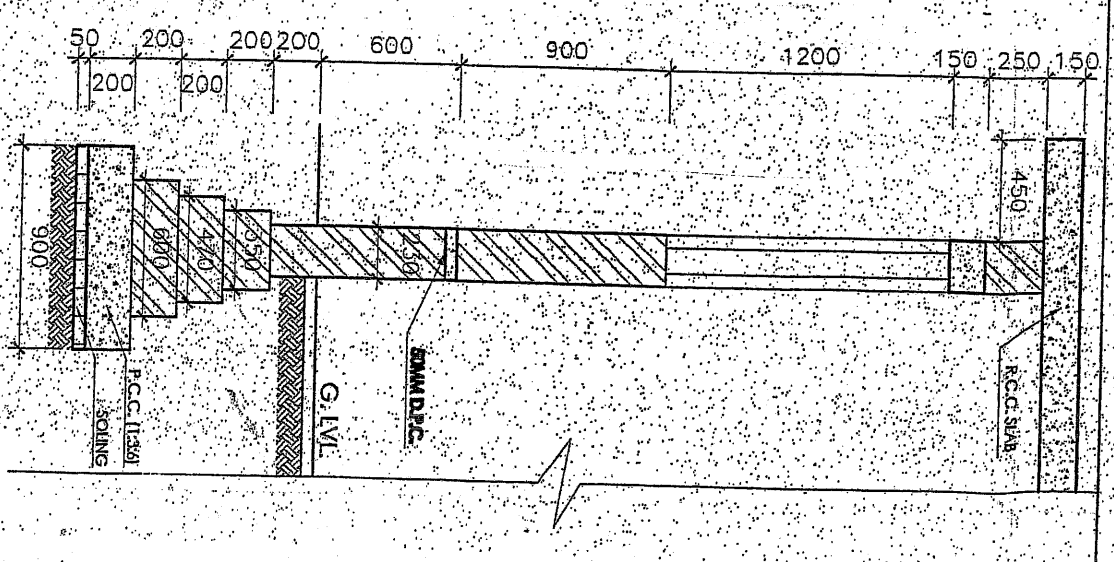| Exam.		Regular/Back	
Level		Full Marks	80
Programme		Pass Marks	32
Year /		Time	3 hrs.

Subject: - Estimating and Valuation

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✓ 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 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 10m³. [6]

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

   i) 10m³ brick masonry in 1:6 cement mortar
   ii) 10m³ 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]

FLOOR PLAN
SCALE 1:100

ROOM
4000X4000

ROOM
8000X4000

Dimensions: 4460, 4230, 230, 1550, 900, 1550, 230, 3000, 4230, 12690, 8230, 7000, 3550, 900, 8230, 12690, W1, D

OPENING SCHEDULE

S.N.	SYMBOL	SIZE	NO.	REMARKS
1	D	1000X2100	2	
2	W1	900X1200	4	

SECTION AT AA
SCALE 1:30

Dimensions: 50, 200, 200, 200, 600, 900, 1200, 150, 250, 150, 900, 600, 470, 350, 230, 450

P.C.C. (1:3:6)
SOLING
G. LVL
50MM D.P.C.
R.C.C. SLAB

c) A town planning authority has to acquire an area of 4,50,000m² 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 m². 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 m².

   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 = 1:1
(Cutting)

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.
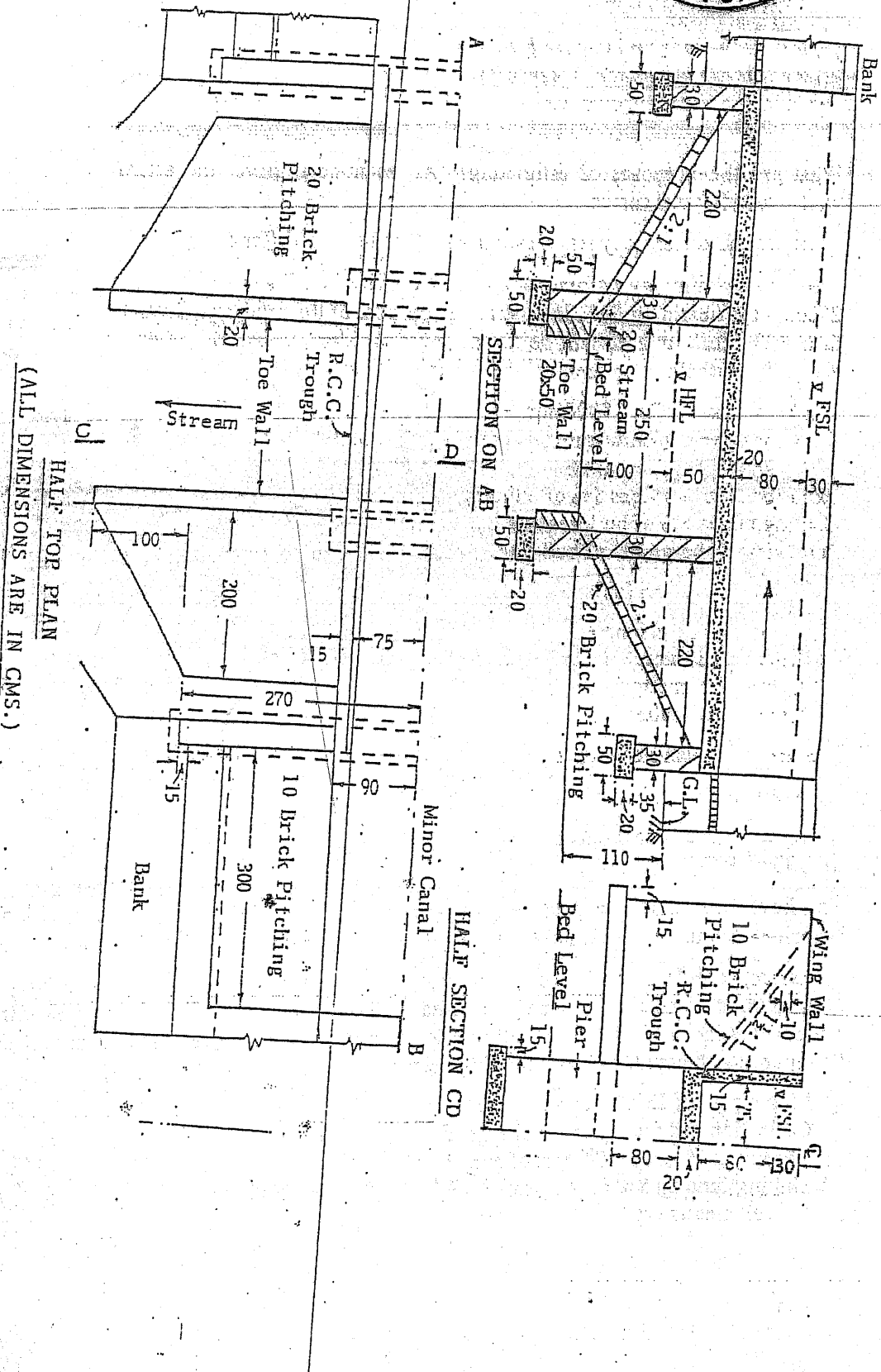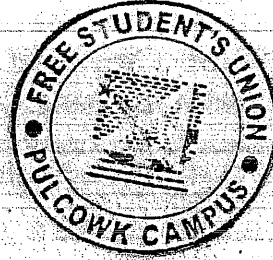The ground levels are as under

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

***

SECTION ON AB

A

20 Brick Pitching

R.C.C. Trough

Toe Wall

D

220

2:1

50
20

20 Stream
20x50
Toe Wall

50

250
100

▽ HFL

▽ FSL

Bed Level

30
50

30

50

20

220

2:1

20 Brick Pitching

G.L.

50
30
35
20

110

15

Bed Level

Pier

Wing Wall

10 Brick Pitching
R.C.C. Trough

10 Brick Pitching
R.C.C. Trough

1:1

▽ FSL

15

80
20

30

HALF SECTION CD

HALF TOP PLAN

(ALL DIMENSIONS ARE IN CMS.)

C

Stream

Toe Wall

100

200

15

75

270

90

15

Minor Canal

Bank

10 Brick Pitching

300

B

Bank

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

Subject: - Estimating and Valuation

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✓ Attempt __All__ questions.
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✓ __Necessary drawings are attached herewith.__
✓ Assume suitable data if necessary.

1. a) It is normal practice to work out the approximate estimate before detailed estimate and final cost is worked out. Is it true? If so, write the different methods of finding approximate estimate. [4]

   b) Where and when following estimates are prepared (i) Supplementary estimate (ii) Unit rate estimate. [4]

   c) How following items are measured (i) painting over door and windows (ii) earthwork in excavation. Write their unit also. [2]

2. a) Prepare a preliminary estimate of a 40 storyed building having carpet area of 400m². 35 percent of built up area is taken up by corridor, verandah, toilet, staircase etc. 10 percent of built up area is taken up by walls. Assume plinth area rate of Rs. 10000 per m² excluding water supply, sanitary, electrical installation, contingency and other services. Assume suitable data. [6]

   b) Find out the quantity of materials required for the following items of work (i) 100m³ P.C.C. (1:2:4) for foundation (ii) 12mm cement sand plaster on wall(1:6) for 375m² [6]

   c) Prepare an analysis of rate for 10m³ brick work in cement sand mortar(1:6) [6]

   d) Prepare an analysis of rate for supply and fixing W.C. commode with low level cistern per number. [6]

3. a) You have been asked to prepare a valuation report of the property for the buying purpose. Mention the various data which you will collect as a valuator. [6]

   b) A building is situated on a land measuring 650m². The area of the built up portion is 20m×10m. The building is first class type and age of the building is 25 years. Work out the depreciated value of property. Assume plinth area rate is Rs 10000 per m².The cost of land per m² is Rs 20000. Life of building is 75 years. [8]

4. a) Calculate the quantity of earthwork in a [portion of a road from following data. Formation width 10m, side slope in cutting and filling are 1:1 and 2:1 respectively. [8]

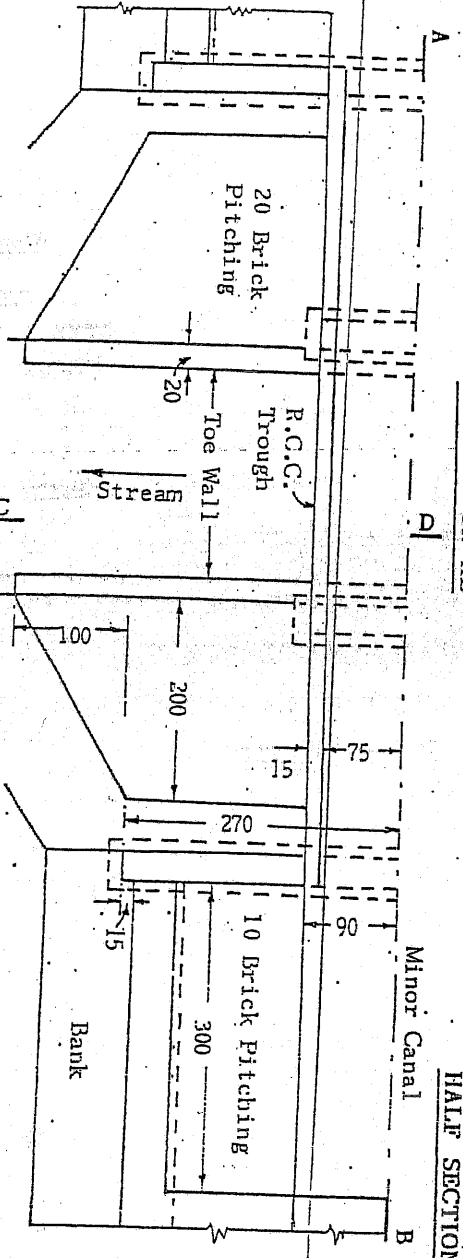 | Distance | 100m | 200m | 300m | 400m |
   |---|---|---|---|---|
   | Height of filling | 1.00m | 1.5m | 0.5m | 2.00m |

   b) Find out the quantities of earth work for a portion of a hill road from the following data: Side slope in cutting and filling are 1:1 and 2:1 respectably, formation width is 10m. [8]

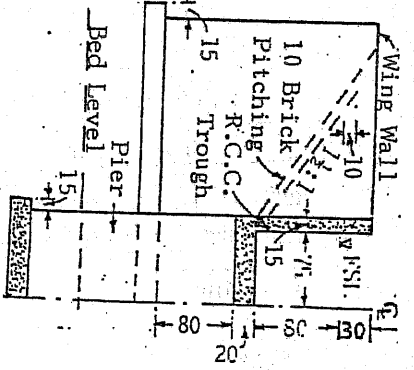 | Distance (m) | Depth of cutting at centre line | Depth of filling at center line | Cross slope |
   |---|---|---|---|
   | 100 | 0.60m | | |
   | 200 | 1.00m | | 9:1 |
   | 300 | | | 10:1 |
   | | | 0.90m | 12:1 |

5. Find out the quantity of following items of work from attached drawing. [7+5+4]

   a) Brick work in superstructure
   b) 12mm thick cement plaster (1:3) in ceiling
   c) 50mm thick DPC (1:1½ :3)

***

SECTION ON AB

Bank
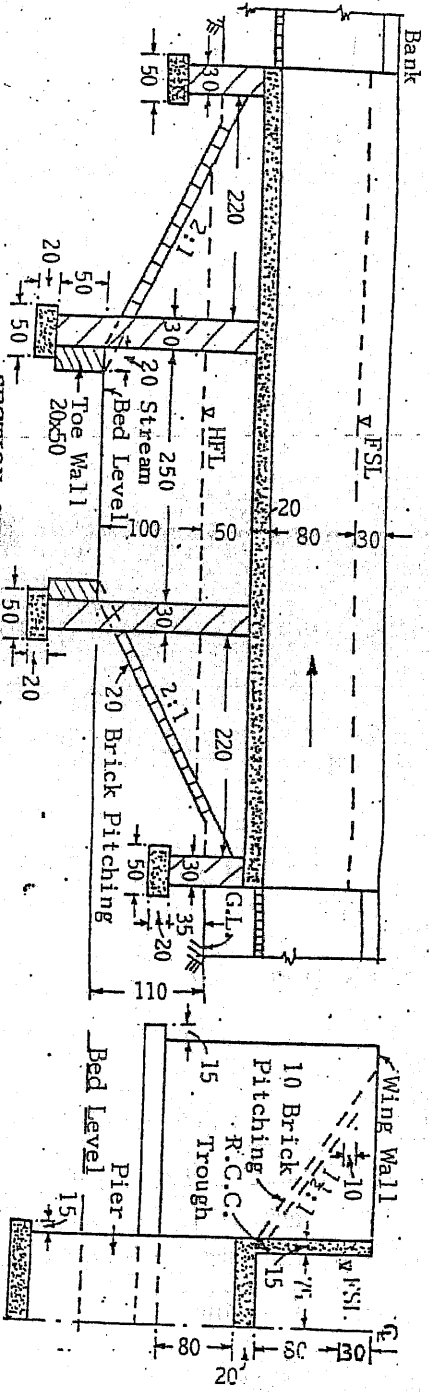
▽ FSL

▽ HFL

20 Brick Pitching

Toe Wall 20x50

20 Stream

Bed Level

250

100

50

80

30

220

2:1

50

30

50

20

50

110

35

20

HALF SECTION CD

Wing Wall

10 Brick Pitching

R.C.C. Trough

Pier

Bed Level

▽ FSL

G.L.

15

15

15

20

80

30

10

2:1

220

2:1

30

50

HALF TOP PLAN

(ALL DIMENSIONS ARE IN CMS.)

20 Brick Pitching

R.C.C. Trough

Toe Wall

Stream

10 Brick Pitching

Minor Canal

Bank

100

200

270

15

75

90

300

15

20

A

B

C

D

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.
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✓ 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 2000m^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) 100m^2 cement sand plaster 12mm thick in (1:6)
   ii) 100m^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 month 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 9/10th 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

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