

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.**(ii) All questions carry equal marks.**

- 1 What is elastic curve?
- 2 List the advantages of fixed beams compared to a simply supported beam.
- 3 Mention any four methods of flexibility co-efficient method of analyzing indeterminate structures.
- 4 Define stiffness.
- 5 Write the difference between sway and non-sway frames.
- 6 What are the various end conditions of a column?
- 7 Define the angle of repose of soil.
- 8 What are the various types of prop?

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.**(ii) All questions carry equal marks.**

- 9 Derive the expression for maximum slope and maximum deflection of a cantilever beam carrying an UDL of its entire span.
- 10 Derive the degree of indeterminacy of any two types of continuous beam?
- 11 Explain the term "carry over moment" and "Carry over factor"
- 12 What you mean by sway? When a portal frame will be subjected to sway?
- 13 What are the assumptions made in Euler's theory of long column?
- 14 Derive the condition to avoid tension at the base of a masonry dam by middle third rule.
- 15 What are the assumptions made in Rankine's earth pressure?
- 16 Distinguish between short column and long column.

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.**(ii) All divisions carry equal marks.**

- 17 A A rectangular beam of size 300 × 400 mm and 6 m span is simply supported at its ends. It carries a central point load of 20 kN. Calculate the maximum slope and deflection, if $E = 1.5 \times 10^5 \text{N/mm}^2$. 10

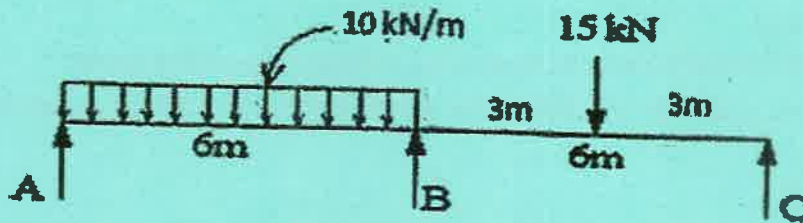
(OR)

- B A continuous beam ABC of length 10 m has two equal spans. The span AB carries an UDL of 18 kN/m over its entire length and span BC carries a point load of 25 kN at 3 m from B. Draw the SFD and BMD. Take A and C as simple supports. Apply theorem of three moment's method. 10
- 18 A A fixed beam of 9 m span supports two point loads of 25 kN each at 3 m from each end. 10
 - (i) Find fixed end moments
 - (ii) Draw the SFD and BMD
 - (iii) Locate the point of contra flexure

(OR)

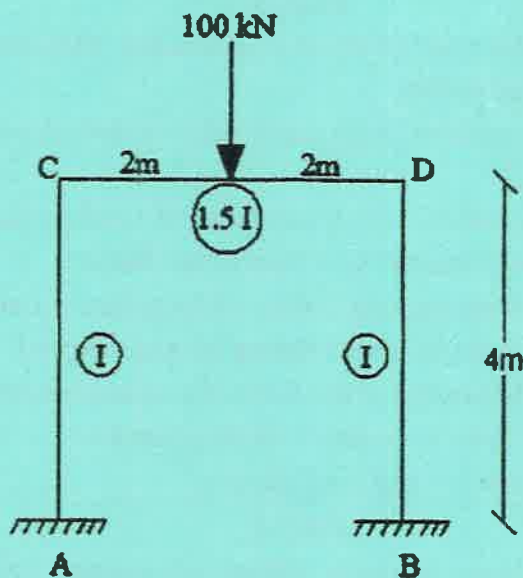
- B A simply supported beam ABC is continuous over two spans AB and BC of 5 m and 4 m respectively. The beam is carrying an uniformly distributed load of 40 kN/m and the span BC is carrying a central point load of 60 kN. Find the support moments using Clapeyron's theorem of three moments. 10

- 19 A Analyse the continuous beam shown in fig. by moment distribution method. Draw the BMD. EI is constant. 10



(OR)

- B For a portal frame shown in fig. Compute the bending moment by moment distribution method and draw BMD. 10



- 20 A Compare the buckling loads by Euler's and Rankine's formula for a tubular steel strut 2.3 m long, having outer and inner dimensions of 100 mm and 75 mm respectively. The strut is hinged at both ends. The yield point stress is 335 N/mm². $E = 2.1 \times 10^5$ N/mm². The Rankine's constant is 1/7500. 10

(OR)

- B A square chimney has external dimensions and internal dimensions are 2.4 m × 2.4 m and 1.2 m × 1.2 m respectively. The height of chimney is 25 m. Find the maximum and minimum stresses. When it is subjected to uniform wind pressure is 1.5 kN/m². The specific weight of masonry as 22 kN/m³. 10

- 21 A A trapezoidal masonry dam 2.5 m wide at top, 5.5 m wide at the base is 15 m high. It retains water to a depth of 12 m on its vertical face. Check the stability of the dam for overturning and sliding if $\mu = 0.60$ and F.O.S = 1.5. Take weight of masonry as 24 kN/m³ and that of water as 9.81 kN/m³. 10

(OR)

- B A trapezoidal masonry retaining wall 1 m wide at top and 3 m wide at base is 7.5 high has a vertical face level with the top of the wall. The angle of repose is 40°. Calculate the maximum and minimum intensities of stresses at the base. Take weight of masonry as 23 kN/m³ and that of earth as 16 kN/m³. 10

PART-A**(5 x 2 = 10 Marks)****Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Name any two advantages of road.
- 2 What is meant by Road Camber?
- 3 Name any two types of Road Machineries.
- 4 What is hair pin bend?
- 5 Define "Creep of rail"
- 6 Name any two types of railway yard.
- 7 Define signaling?
- 8 What is Scour?

PART-B**(5 x 3 = 15 Marks)****Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 What is meant by "three phase diagram"
- 10 What are the objects of soil stabilization?
- 11 What is fish plate?
- 12 What is meant by "Coning of Wheel"?
- 13 What is the purpose of buffer stop?
- 14 Define interlocking.
- 15 State the different types of culvert.
- 16 Write down the various types of Wingwall.

PART-C**(5 x 10 = 50 Marks)****Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

- | | | | |
|----|---|--|----|
| 17 | A | Explain about "Nagpur Plan" and its recommendation. | 10 |
| | | (OR) | |
| | B | i) What are the various types of sight distance and explain any one in detail. | 5 |
| | | ii) What are the objects of road arboriculture? | 5 |
| 18 | A | State the advantages and disadvantages of cement concrete road. | 10 |
| | | (OR) | |
| | B | i) What are the points to be considered while fixing high way alignment? | 5 |
| | | ii) Write formation of hill road in "full embankment" | 5 |
| 19 | A | i) What are the requirements of good sleeper? | 5 |
| | | ii) What is "Plate laying" and Name the various methods of plate laying? | 5 |
| | | (OR) | |
| | B | How the Railway Track is maintained effectively? | 10 |
| 20 | A | i) What is the purpose of points and crossing? | 5 |
| | | ii) Explain about "Tube railways". | 5 |
| | | (OR) | |
| | B | Explain the methods of interlocking with neat sketches. | 10 |
| 21 | A | i) State the names of bridges on various classification. | 5 |
| | | ii) What are the different types of abutment and explain anyone in detail. | 5 |
| | | (OR) | |
| | B | What is "coffer dam" and explain briefly with neat sketches. | 10 |

- B A tachometer fitted with an anallatic lens was set up over a BM 250.000 10
above datum and the following readings were obtained on a vertically held staff:

Staff station	Vertical angle	Stadia hair readings (m)
P	+5° 14'	0.450, 1.035, 1.620
Q	- 7° 23'	0.860, 1.270, 1.680

Calculate the distances of P and Q from the instrument station and their elevation.
The height of the instrument is 1.500 m and $K = 0.3$ m

- 19 A Find the elevation of the top of the chimney from the following data. 10

Inst. Station	Reading on BM	Angle of elevation	Remarks
A	0.860	18°36'	RL of BM 420.500 m
B	1.220	10°12'	Distance AB = 50 m

Station A and B and the top of chimney are in the same vertical plane.

(OR)

- B i. What is sounding? Explain the depth measurement equipment and positioning system equipment. 5
ii. Explain the methods of remote sensing. 5

- 20 A i) Briefly explain the elements of a simple circular curve. 5
ii) Describe the procedure for setting out the curve in the field based on offsets from long chord. 5

(OR)

- B Two tangents intersect at chainage 1250 m. The angle of intersection is 150°. Calculate all data necessary for setting out a curve of radius 250 m by the Rankine's method. The peg intervals may be taken as 20 m. Calculate the data for field checking. 10

- 21 A i) Write short notes on Electronic display in total station. 5
ii) Briefly write the field procedure to run a traverse survey using total station. 5

(OR)

- B (i) List out the field applications of GIS. 5
(ii) Explain Land information system. 5

THIAGARAJAR POLYTECHNIC COLLEGE, SALEM

(Autonomous)

Reg. No.

April 2019 Examinations
DIPLOMA IN CIVIL ENGINEERING

Estimating and Costing-I

Year/Sem: II / IV (EVEN-II)

Max. Marks : 75

Time : 3 hr.

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 Define Estimate.
- 2 What is meant by Lump sum?
- 3 What is level section?
- 4 Define area of regular sections.
- 5 Define observed data.
- 6 What do you mean by sundries?
- 7 Why rounding of quantities are necessary?
- 8 What is cancellation of dimensions in group system?

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 State the duties and requirements of good quantity surveyor.
- 10 Explain the method of calculating area of an irregular boundary.
- 11 What is lead statement? Explain its use.
- 12 Explain the individual wall method of taking off quantities
- 13 What are the points to be considered while checking the bill?
- 14 Differentiate between a level section and two level section with sketches.
- 15 Prepare the Data for L.M 1:4 – 1 m³.
- 16 Explain uses of abstract sheet.

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.

(ii) All divisions carry equal marks.

- 17 A Workout the quantities of lime, surki, sand, tiles required for the following works. 10
- i) Flat tiles of size 200 X 200 X 20 mm size for flooring - 10 m²
 - ii) Surki mortar 1: ½: 1 ½

(OR)

- B The actual expenditure incurred in the construction of a single storey residential building of plinth area 72 m² is found to be Rs. 2,84,400/- in which 60% is towards the cost of materials and the remaining is towards the cost of labour. It is now proposed to construct a similar building of same height and specifications with a plinth area 94 m² at place where the cost of materials is 10 % more and the cost of labour is 20% less. Estimate approximately the cost of the proposal building. 10
- 18 A The perpendicular offset were taken from a survey line to an irregular boundary line, Calculate the area between the survey line, the boundary and the end offsets by the application of (i) Trapezoidal rule and (ii) Simpson's rule. 10

DISTANCE (m)	0	30	60	90	120	150	180
OFFEST (m)	4	8	13	18	16	21	6

(OR)

- B An embankment is 9 m wide with side slope of 2 to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume of earthwork contained in a length of 300 m. The centre heights at every 50 m intervals are given below:- 10

DISTANCE (m)	0	50	100	150	200	250	300
OFFEST (m)	0.5	1	1.5	1.67	2	1.17	0.67

- 19 A Prepare the data for R.C.C 1 : 1.5 : 3 for 300 mm X 300 mm size columns – Rate per mm³. 10

(OR)

- B Prepare the data for A.C Sheet roofing for 1 m² and Prepare the data for weathering course with brick jelly for 1 m² 10

Materials and labours required

R.C.C 1:1.5:3 for 300mm X 300mm size columns – 1 mm³

Broken stone(20 mm)	-	0.9 m ³
Sand	-	0.45 m ³
Cement	-	430 kg
Steel bars	-	180 kg
Binding wire	-	2 kg
Mason II class	-	0.5 no
Mazdoor category I	-	3.5 No.
Mazdoor categoryII	-	3.5 No.
Catering Charges	-	13.33 m ²

A.C sheet roofing – 10 m²

A.C. Sheet	-	11.5 m ²
Adjustable ridges, 'U'bolts etc	-	Rs. 300/10 m ²
Fitter II Class	-	2.2 Nos
Carpenter I class	-	1.1 Nos
Mazdoor I class	-	3.2 Nos.

Weathering course with Brick jelly – 10m²

Broken jelly	-	12.8 m ³
Lime	-	5 m ³
Mason I	-	1.8 Nos.
Mazdoor I	-	17.7 Nos.
Mazdoor II	-	14.1 Nos.

Cost of materials at site

Broken stone(20 mm)	-	Rs. 400/m ³
Sand	-	Rs. 190.00/m ³
Cement	-	Rs. 160.00/bag
Binding wire	-	Rs. 30/kg
Steel bar	-	Rs. 750.00/quintal
Bending and tying rods	-	Rs. 2,000/t
Mason II class	-	Rs. 140/each
Centering charges	-	Rs. 120/m ²
Mazdoor category I	-	Rs. 150.00/each.
Mazdoor categoryII	-	Rs. 120.00/each.
A.C.Sheet	-	Rs. 52/m ²
Lime	-	Rs. 1025/m ³
Fitter II	-	Rs. 170/-
Carpenter I	-	Rs. 180/-

- 20 A Take the following quantities for the Sketch - 1 using trade system. B.W IN CM 1:5 for superstructure and Sand filling in basement. 10

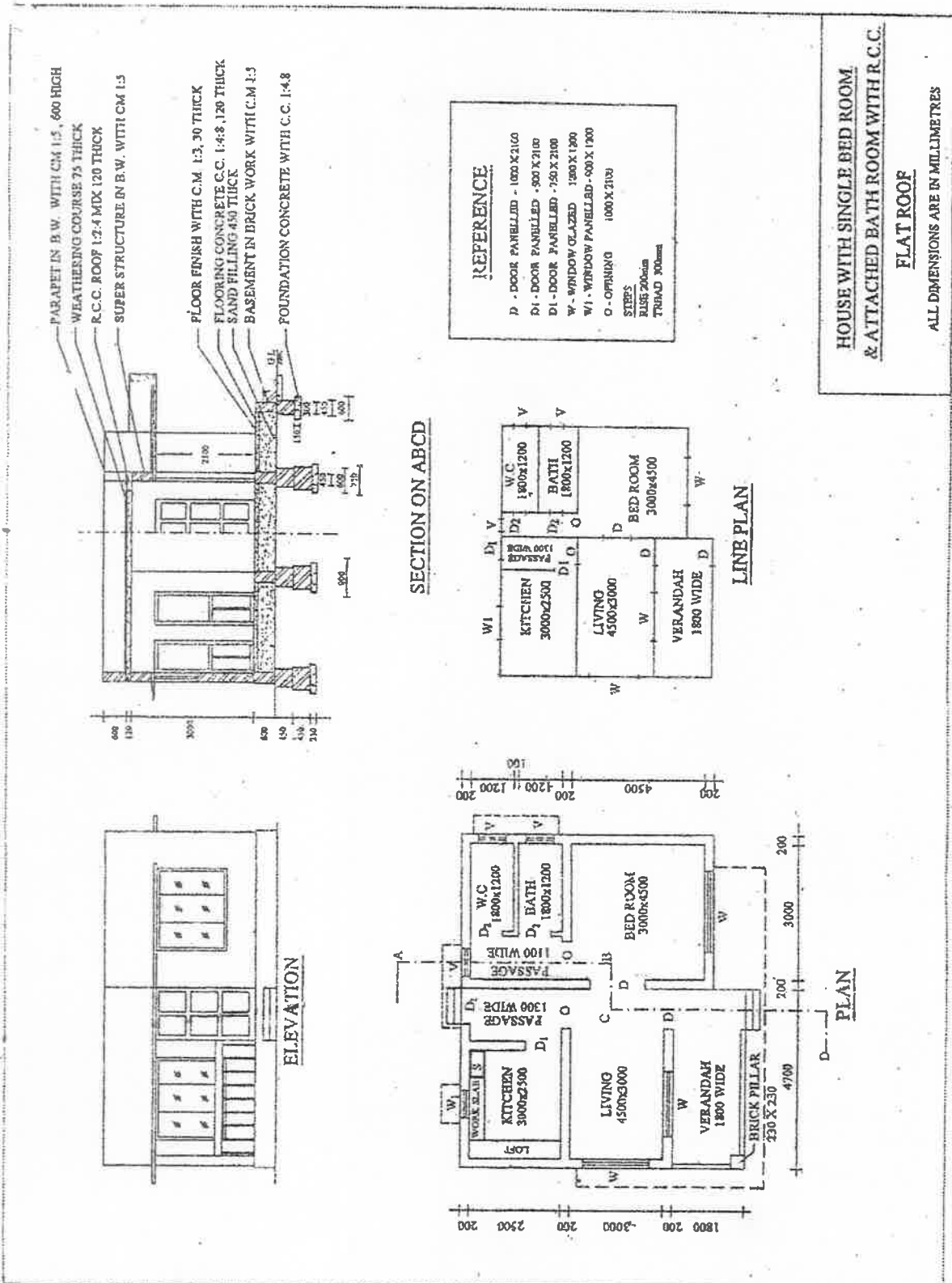
(OR)

- B Take the following quantities for the Sketch - 1 using trade system. Earth work excavation and brick work in foundation. 10

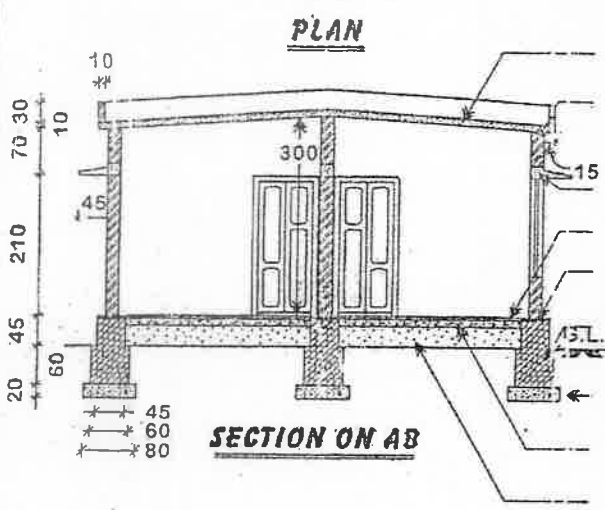
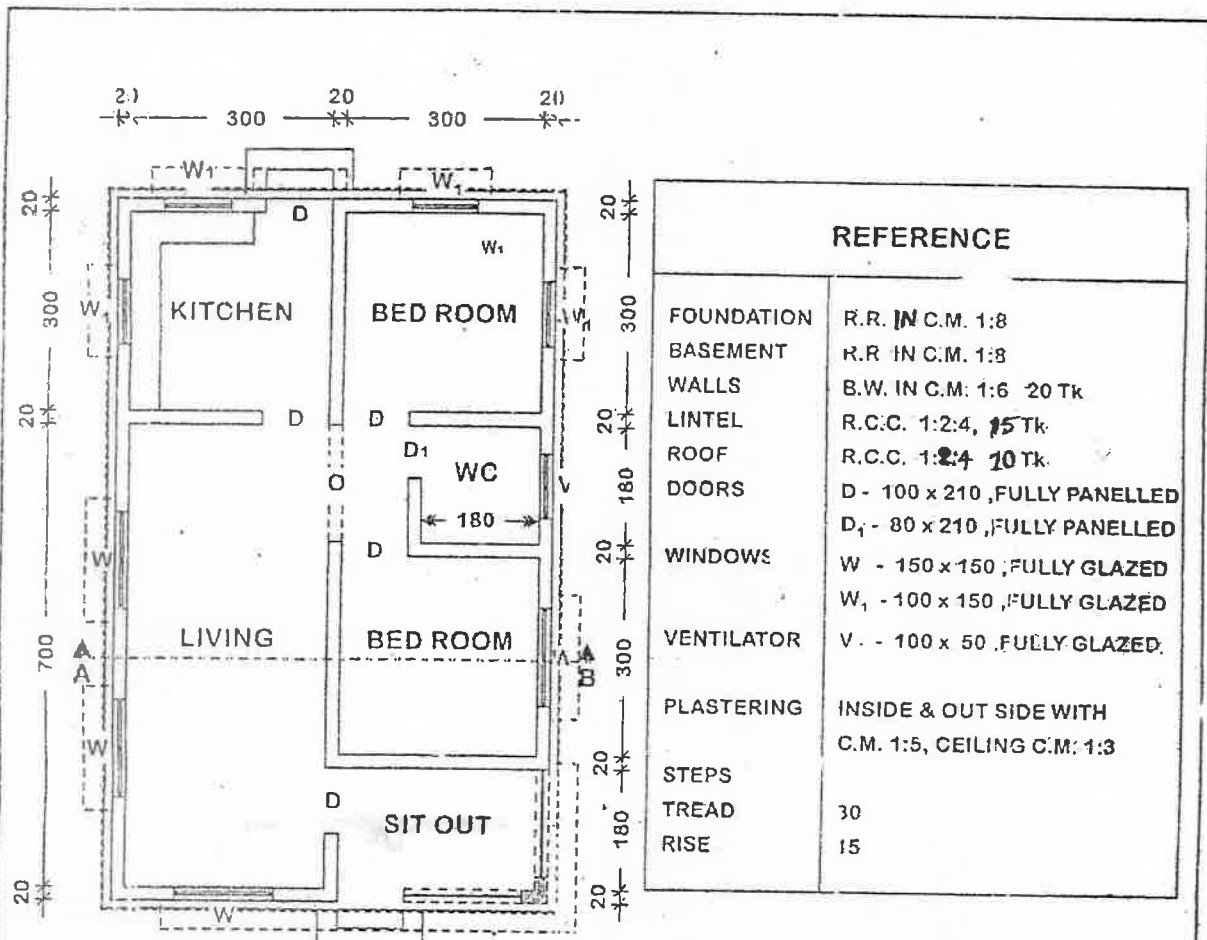
- 21 A Take the following quantities for the Sketch - 2 using group system. R.C.C 1:2:4 for roof slab and B.W in Parapet wall. 10

(OR)

- B Take the following quantities for the Sketch - 2 using group system. Plastering with C.M 1:2 – 12 mm thick and B.W in foundation. 10



Sketch - 1



ROOFING WITH C.C. 1:2:4, 100 THICK
 BRICK WORK IN SUPER STRUCTURE
 WITH C.M. 1:5, 200 THICK

LINTEL CUM SUNSHADE, 150 THICK
 FLOOR FINISH WITH C.M. 1:4, 20 THICK
 D.P.C. WITH C.M. 1:3, 20 THICK
 R.R. MASONRY IN FOUNDATION AND
 BASEMENT WITH C.M. 1:5

CEMENT CONCRETE FOR
 FOUNDATION, 1:4:8, 200 THICK
 FLOORING WITH CEMENT
 CONCRETE, 1:4:8, 130 THICK
 SAND FILLING, 300 THICK

A COTTAGE WITH SLOPED R.C.C. ROOF
 ALL DIMENSIONS ARE IN CM.

Sketch - 2