N.B. : (1) Question No. 1 is compulsory.
   (2) Attempt any four questions out of remaining six questions.
   (3) Assume suitable data wherever necessary.
   (4) Show clear calculations stepwise if required.
   (5) Figures to the right indicate full marks.

1. Calculate the quantities of following items of work for the building shown in   20
   Figure No.1.
      (a) Earthwork in excavation
      (b) 1st class B.W. in C.M. (1:4) in foundation and plinth
      (c) 1st class B.W. in C.M. (1:6) in superstructure
      (d) C.C. (1:2:4) for RCC works.
      (Refer figure on page 3)

2. (a) Prepare the abstract for all items in Q. No.1.   5
   (b) Prepare Rate analysis for –
      (i) 1st class B.W. in C.M. 1:6 for superstructure   7
      (ii) 7·5 cm thick C.C. floor 1:4:8 with overburnt chips.   7

3. (a) Prepare a preliminary estimate for a framed four storied office building having   10
      a carpet area of 300 sq.m. for each floor. Assume areas occupied by corridor,
      verandah, lavatories, staircases etc as 25% of built up area and that occupied
      by walls and columns as 8·5% of the same.
   (b) Write down the detailed specification for First Class brick work.   10

4. (a) Draft a tender notice for construction of hospital building having 500 beds   8
      by an executive engineer of CIDCO Navi Mumbai with an estimated cost of
      Rs. one crore and the duration of project is 24 months.
   (b) The groundlevels at various chainages along the centre line of a proposed   12
      road are as under :–

Chainage	21	22	23	24	25
G.L. RL(m)	180·5	183·36	185·52	187·10	186·50

   The ground has uniform cross slope of 1 in 8. The chain is 30 mt long.
   The road formation is proposed as uniform gradient passing through the
   G.L. and end chainage with formation width as 8 m and side slope of cutting
   as 1:1. Estimate the quantity of earthwork for the proposed road section
   in a tabular form.

      (c) Short circuiting
      (d) Under drainage system of rapid sand filter
      (e) Ion exchange process
      (f) Tube settlers.

5. (a) A building stands on a freehold plot of land measuring 600 m² yield gross rent of Rs. 1000 per month. A price of land is Rs. 75/m². The estimate future life of the building is 12 years, but it is expected to extend by anothe 16 years, if structural and other repairs costing Rs. 16,000 are immediately carried out. The total amount of outgoings is 25% of gross rent. The owne requires 7% return on land and 11% return on building with 6% for redemption of capital. Find out whether it will be advisable to spend the above cost of repairs from investment point of view.

   (b) What is contract ? Enlist different types of contract and explain in detail the conditions of valid contract.

6. (a) Figures No. 2 shows plan and c/s of the footing slab with a square R.C. column 20 cm outside with the following particulars :–

Area of base of slab = 1m x 1m

Area of base of column = 28 cm x 28 cm.

Depth of slab at column face = 40 cm

Depth of slab at outer edge = 15 cm.

Reinforcement in the slab = 12 mm ϕ bars both ways at 15 cm c/c

Reinforcement in the column = 4 nos. 12 mm ϕ bars with 8 mm ϕ binders

at a pitch of is 18 cm c/c and for slab is 50 mm and for column is 25 mm.

If weight of 12 mm ϕ bar and 8 mm ϕ bars are 0.89 kg and 0.39 kg per mt respectively.

Calculate the (i) Quantity of steel

             (ii) Volume of concrete (1:2:4)

(Refer figure on page 4)

   (b) Explain belting method of valuation of land.   8

7. Write short notes on :–   20
    (a) Centre line method of taking out quantities
    (b) Freehold and leasehold property
    (c) Defect liability and price escalation
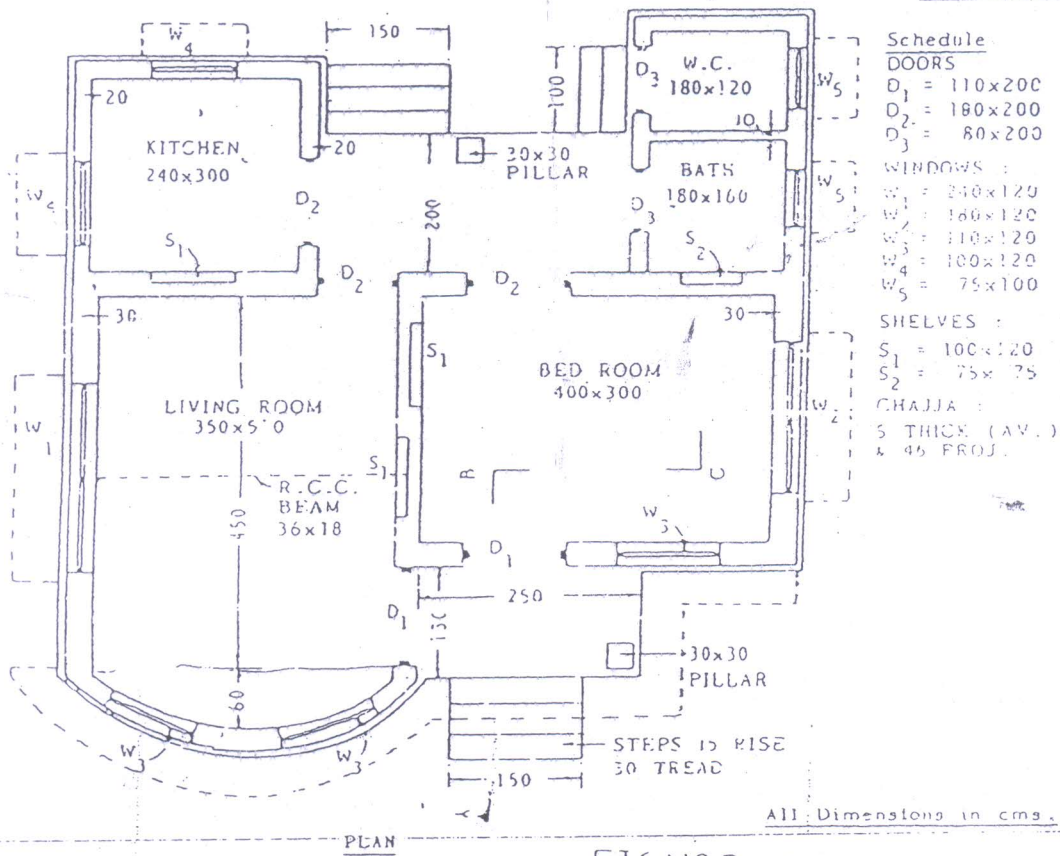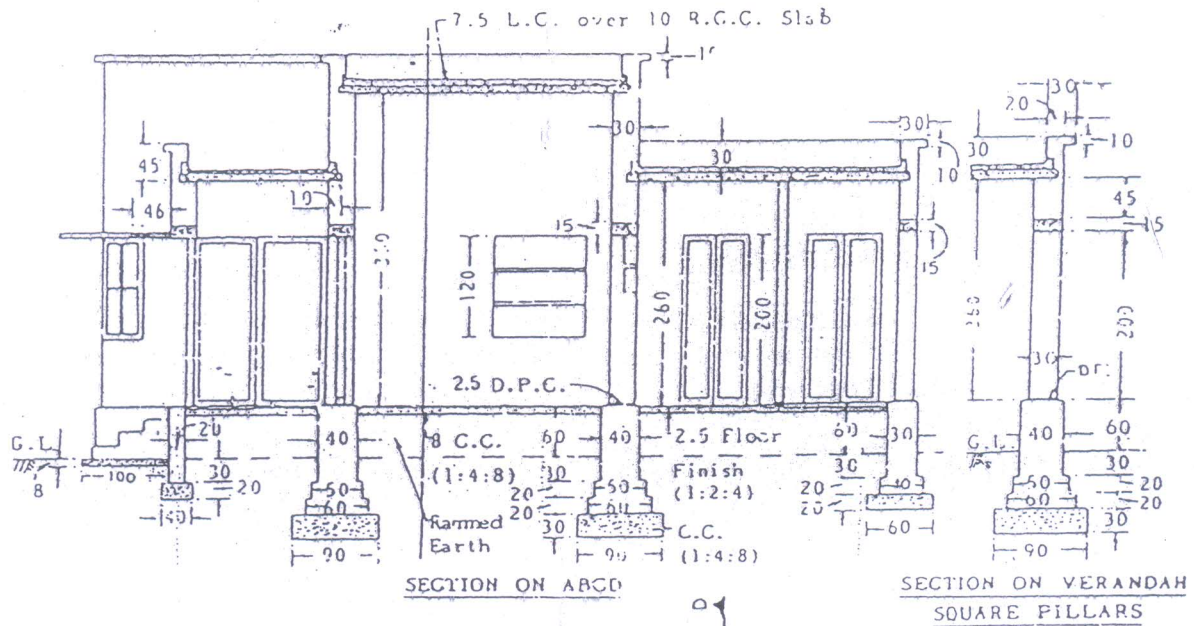   (d) CBRI method of approximate estimate.

FIGURE No. 1

(c) Short circuiting
(d) Under drainage system of rapid sand filter
(e) Ion exchange process
(f) Tube settlers.

SECTION ON I-I
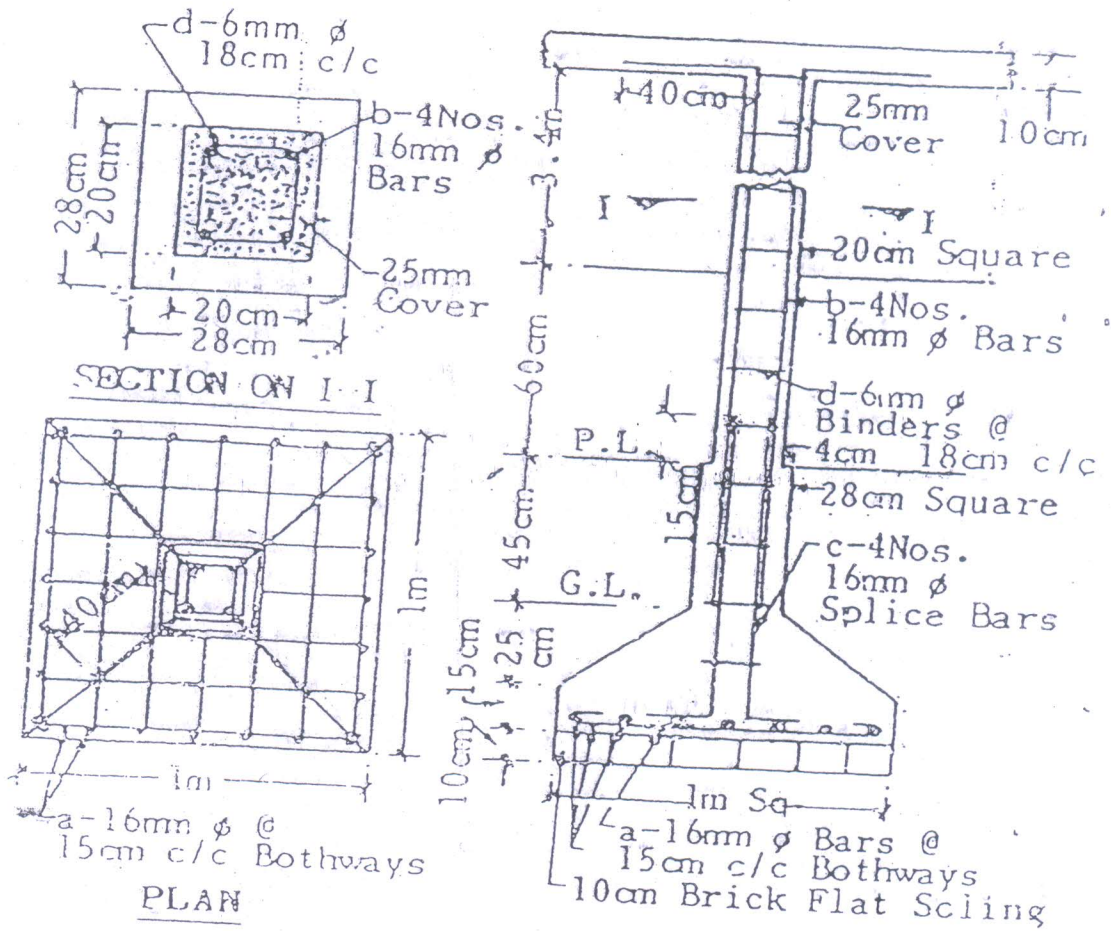
d-6mm ø 18cm c/c

b-4Nos. 16mm ø Bars

28cm | 20cm

20cm | 28cm

25mm Cover

PLAN

40cm

1m | 1m

a-16mm ø @ 15cm c/c Bothways

40cm

25mm Cover

10cm

20cm Square

b-4Nos. 16mm ø Bars

d-6mm ø Binders @ 18cm c/c

4cm

28cm Square

c-4Nos. 16mm ø Splice Bars

60cm | 45cm

P.L.

15cm

G.L.

10cm | 15cm | 25cm

1m Sq.

a-16mm ø Bars @ 15cm c/c Bothways

10cm Brick Flat Soling

FIGURE NO. 2