

Total No. of Questions : 4]

SEAT No. :

P-1387

[Total No. of Pages : 2

[6078]-71

F.Y. B.Arch.

**BUILDING CONSTRUCTION AND MATERIALS - I**  
**(2019 Pattern) (Semester - I) (1201902)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary,*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*
- 5) *Answer all questions from Section-I on Drawing Sheets and from Section-II in Answer Book only.*

**SECTION - I**

**Q1)** Draw any one of the following **[20]**

Draw L-junction for 1½ bk. Thick wall in Flemish bond (scale 1 : 10) :

- a) Plan of alternate courses
- b) Elevation of six courses

OR

Draw Plan, Elevation and section of “Square rubble masonry” at stop end wall of height 1.5m, length of 2.1 m and dept of foundation is 0.9 (Scale 1:10) (Consider wall thickness of 450 mm).

**Q2)** Draw neat and labeled sketches **ONLY** for the following (Any three) : **[15]**

- a) Section through Building explaining various elements.
- b) Draw 5 types of bricks used in masonry work.
- c) Draw Semicircular arch showing its components.
- d) Draw any five bamboo joinery with nomenclature.
- e) Sketch five masonry tools with nomenclature used in construction.

**P.T.O.**

## SECTION - II

**Q3)** Answer any two : **[20]**

- a) Explain the load transfer system in load bearing structure with appropriate sketches.
- b) Explain shallow foundation. Explain strip foundation with sketches.
- c) What is mortar? Explain any three types of mortar in brief.
- d) Explain advantages and Disadvantages in bamboo as construction material.

**Q4)** Answer any three of the following : **[15]**

- a) What is pointing? Explain any three types with sketches
- b) List down advantages of concrete blocks.
- c) What are qualities of good brick?
- d) Explain importance of sand in cement mortar
- e) What is dressing of stone? Explain any two types of stone dressing.



[6078]-72

F.Y. B.Arch.

Theory of Structures - I

(2019 Pattern) (Semester - I) (1201904)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q. No.1 & 5 are compulsory. Solve any 2 from the other 3 in each section.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable, data, if required mention the assumption.
- 4) Use of non-programmable calculator is allowed.

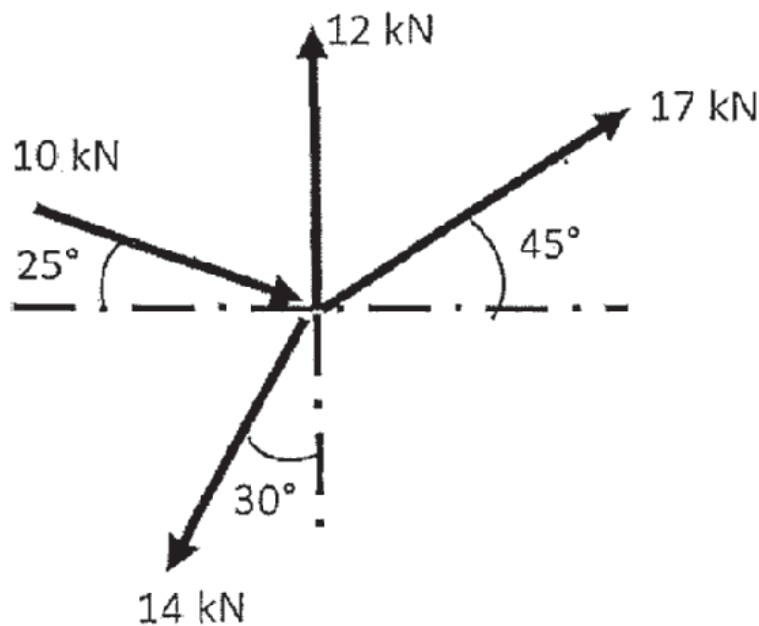
SECTION - I

Q1) Compulsory.

[13]

- a) Answer the following
  - i) Explain the terms: Collinear forces and Like parallel forces. [3]
  - ii) Define - Equilibrant Force. State its properties. [3]
- b) Find Resultant Force both in Magnitude and Direction for a given system

[7]

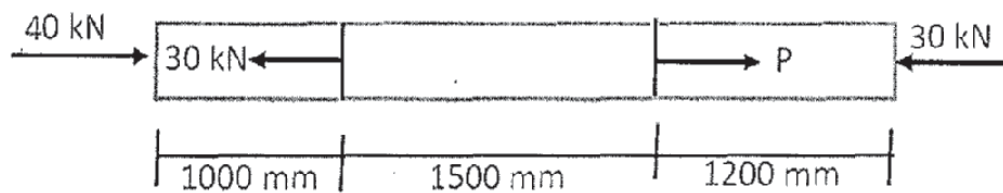


P.T.O.

**Q2) a)** A R.C.C. column of size  $350 \times 500$  is reinforced with 12 no. of 20mm diameter steel bars. If the load carried by column is 1700kN. Calculate the stress in each material and load carried by each material. Given  $E_{con} = 0.25 \times 10^5 \text{ N/mm}^2$ . [8]

b) Draw stress strain diagram for Mild Steel and show important points.[3]

**Q3) a)** A three steel bar connected to each other of area  $400\text{mm}^2$ ,  $600\text{mm}^2$  and  $300\text{mm}^2$  respectively are subjected to axial loads along its length as shown and it is in Equilibrium, If  $E = 2 \times 10^5 \text{ N/mm}^2$ . Find 'P' for Equilibrium and calculate total change in length. [7]



b) Define following terms: Young's Modulus and Poisson's Ratio. [4]

**Q4) a)** Explain the method of Transfer of load in Framed Structure. [3]

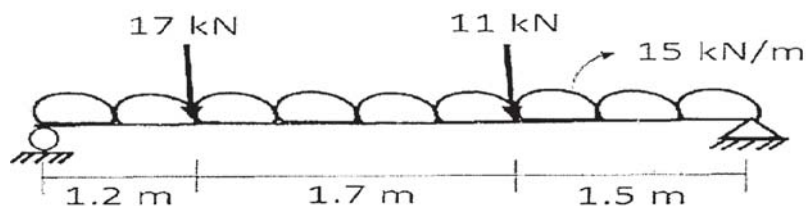
b) Write an Advantages and Dis-advantages of Load Bearing Structure.[4]

c) Suggest few measures to make Load Bearing structure better resistant to Seismic Forces. [4]

## SECTION - II

**Q5) a)** Draw SFD and BMD for the given beam figure. [11]

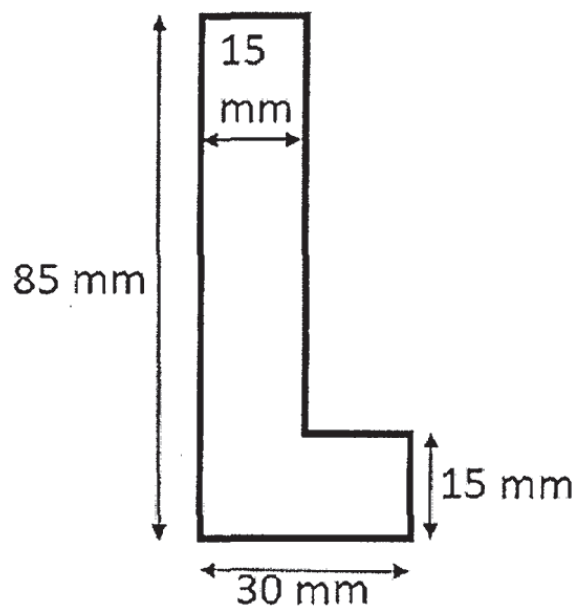
- i) Findings reactions
- ii) Shear force diagram with point of contrashear
- iii) Bending moment diagram
- iv) Maximum bending moment



b) Define S.F at a point on a Beam and Define S.F.D [2]

- Q6) a)** Draw Shear Force and Bending Moment diagram for a Simple Supported beam having a length of 'L' with central point load 'P'. Indicate maximum values of shear force and bending moment diagram. [4]
- b) Find the support reaction of Simple supported R.C.C. beam of  $230 \times 500$  mm, carrying the load of brick wall of 230 mm thick and 3.2 m height above it. Length of beam between centre to centre supports is 4.5m. [7]

- Q7)** Find centre of gravity at X and Y co-ordinate with respect to origin. Also find moment of inertia about Centroidal XX and YY axis for the lamina shown in figure [11]



- Q8) a)** State the Theorem of Parallel Axis w.r.t M.I and explain with a sketch its application. [4]
- b) Explain the following : [4]
- Radius of gyration
  - Define Support and explain a Pinned Support with Sketches.
- c) Draw a Cantilever Beam of span I and full u.d.l. w and draw its S.F.D and B.M.D showing important values. [3]



Total No. of Questions : 4]

SEAT No. :

**P1389**

[Total No. of Pages : 2

[6078]-73

**F.Y. B. Arch.**

**BUILDING CONSTRUCTION AND MATERIALS - II**

**(2019 Pattern) (Semester - II) (1201910)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*
- 5) *Answer all questions from Section - I on Drawing Sheets and from Section - II in Answer Book only.*

**SECTION - I**

**Q1)** Draw any one of the following: **[20]**

A room of size 5.0 m × 9.0 m internal dimension needs a king post truss roofing. Draw well labeled.

- a) Elevation of a king post roof truss at 1:20 Scale.
- b) Draw detail of any one joinery at 1:10 Scale.
- c) Draw key plan at 1:100 Scale.

OR

An office area of 3000 × 6000 mm in size has a door opening of 900 × 2100, with wall thickness of 230 mm. **[20]**

Draw well labeled

- a) Plan, Section and Elevation of a panelled door at 1:10 Scale.
- b) Draw any one joinery details used in this door construction. 1:10 Scale.

**Q2)** Write answers of any 3 of the following. **[15]**

- a) Sketch Cut section of a tree.
- b) Sketch and name any five types of fasteners used in doors and windows.
- c) Sketch and name any three types of defects in timber.
- d) Draw a well labeled section through a close couple roof.
- e) Sketch and name any 2 types of Domes and Vaults.

**P.T.O.**

## SECTION - II

**Q3)** Explain in detail with sketches any 2 of the following. **[20]**

- a) Explain with neat sketch a Timber Partition.
- b) Explain with neat sketch Single Timber Floor.
- c) Explain with neat sketch Timber Staircase.
- d) Explain with neat sketch Timber Casement Window.

**Q4)** Write short notes on any 3 of the following. **[15]**

- a) Seasoning of Timber.
- b) Clay roofing tiles.
- c) Advantages of Plywood
- d) Earthquake and name any 3 terminologies.
- e) Necessity of reinforcing masonry walls.



Total No. of Questions : 8]

SEAT No. :

**P1390**

[6078] - 74

[Total No. of Pages : 3

**First Year B. Arch.**

**THEORY OF STRUCTURES - II**

**(2019 Pattern) (Semester - II) (1201912)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

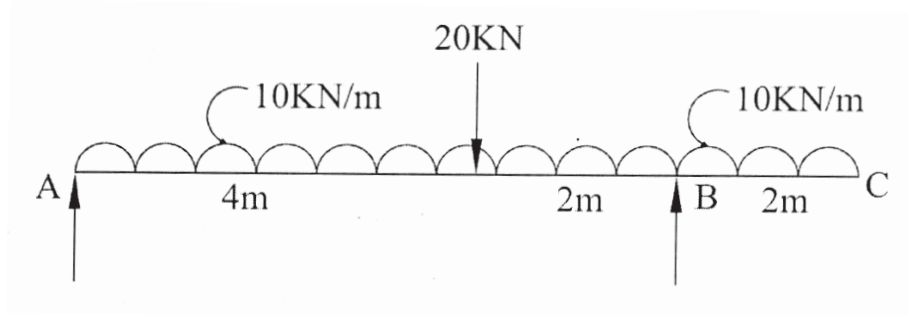
- 1) *Q. No. 1 & 5 are compulsory. Solve any 2 from the other 3 in each section.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data, if required mention the assumption.*
- 4) *Use of non-programmable calculator is allowed.*

**SECTION - I**

**Q1) Compulsory.**

- a) A rectangular beam of size 230 mm wide & 450 mm deep is used over a simply supported span of 5.0 meter. It carries u.d.l. of 4.0 KN/m over entire span along with central point load of 5 KN. [7]
  - i) Calculate the maximum tensile and compressive bending stress.
  - ii) Draw Bending stress diagram across cross section.
- b) Write down the Flexural formula and explain each term. [3]
- c) Explain why Deeper Beams are stronger to Resist Moments than Wider Beams? [3]

**Q2) Draw SFD & BMD for a given beam as shown in fig. Show the point of contra-shear. [11]**



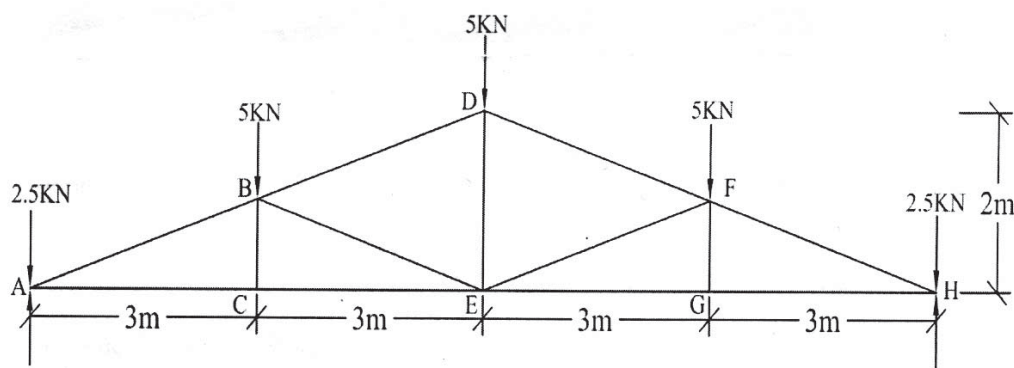
**P.T.O.**



**Q3) a)** A Steel section of 120mm diameter is used as a cantilever over a span of 2.5m and carries an udl of 30kN/m over the entire span and a point load of 10kN at the free end. Draw the Shear Stress Diagram across the section showing important values. Calculate the maximum shear. [7]

b) Write down the maximum shear stress formula for a rectangular and circular section. [4]

**Q4) a)** For the truss shown below, calculate the forces in members DF, EF, EG. [8]



b) Define an imperfect frame. Explain giving example. [3]

### SECTION - II

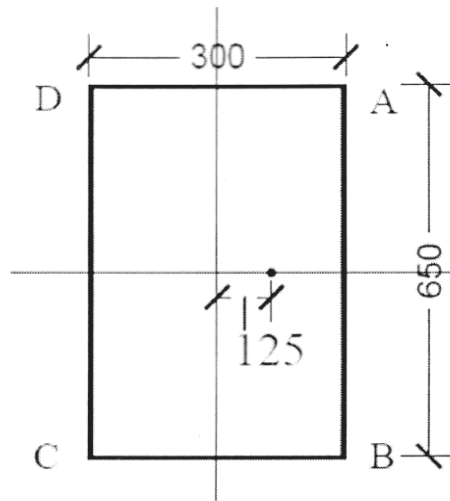
**Q5) Compulsory.**

a) A steel rod 6m long and having diameter 50mm is used as column with one end fixed and other end free. Determine Euler's load if  $E = 2 \times 10^5 \text{ N/mm}^2$ . [8]

b) State the assumptions of Euler's theory of Buckling. [3]

c) What are Short and Long Columns? [2]

- Q6) a)** For the column shown below find the stresses at all four corners. Load is of 600 KN at a distance of 125 mm from YY - axis along XX - axis only. Draw the stress diagram across all four sides. [8]



- b) State and explain with the neat sketch middle third rule for rectangular column. [3]
- Q7) a)** A concrete column of size  $230 \times 400$  is used as a column with both ends hinged of height 10.0m. If  $E = 0.20 \times 10^5$  N/mm<sup>2</sup>, find Failure Load by Rankine's Theory. Crushing Stress in Concrete is 25 N/mm<sup>2</sup>. [7]
- b) Draw a cantilever beam with full UDL. Show the deflection curve, point of maximum deflection, point of maximum slope and write down the formulae for the same. [4]
- Q8) a)** A beam of size 230 mm  $\times$  650 mm is simply supported and carries a load of 25 KN/m over the entire span of 6.5 m. If  $E = 0.25 \times 10^5$  N/mm<sup>2</sup>, calculate maximum deflection. [7]
- b) Define the following terms. [4]
- Section Modulus
  - Neutral Axis



Total No. of Questions: 4]

SEAT No. :

**P1391**

**[6078]-75**

[Total No. of Pages : 3

**S.Y. B. Arch.**

**BUILDING CONSTRUCTION AND MATERIALS -III**  
**(2019 Pattern) (Semester-III) (2201918)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

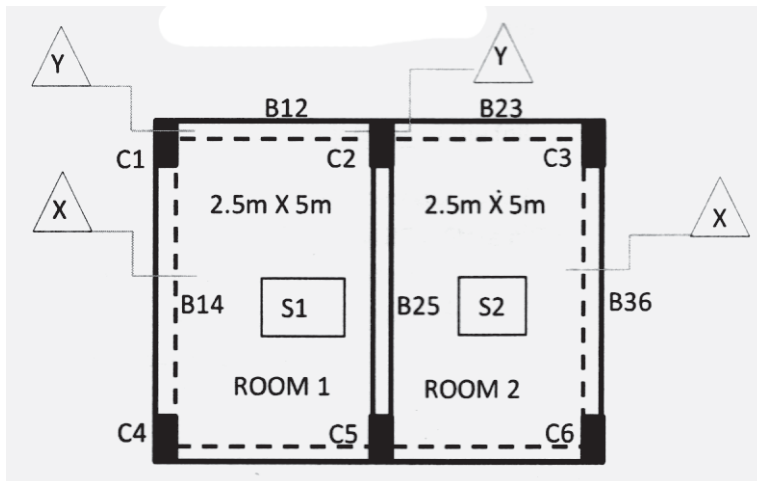
- 1) *All questions are compulsory.*
- 2) *Answer to Section I to be attempted on drawing Sheet only.*
- 3) *Answer to section II to be written on answer sheet only.*
- 4) *Draw neat, labelled sketches wherever necessary.*
- 5) *Assume suitable data wherever necessary.*
- 6) *Figures on right of each question indicate full marks.*

**Q1)** Two Rooms as shown are situated on first floor of a residential building. The structure is built in RCC Frame. Draw the following to the scale of 1:10 showing all the required details.

Assume data : C1, C2, C3 - (230×450)

B12, B23 - (230×450)

B14, B25, B36 - (230×600)



- a) Draw section X-X, showing reinforcement details. [10]
- b) Draw Beam Longitudinal Section Y-Y showing reinforcement details [5]
- c) For Beam drawn above, draw cross sections at Support and Mid-span. [5]

OR

*P.T.O.*

A plinth needs to be constructed for a Security office of size  $3\text{m} \times 4\text{m}$  in RCC frame structure. The Office needs to have a 1.2 m wide open platform on front side, and provision for attached toilet of size  $2.0\text{m} \times 1.2\text{m}$ . considering plinth level 450mm above the existing ground level, draw the following to the suitable scale.

- a) Draw the RCC framing plan for the above plinth showing column footings, columns, and beam positions. [10]
- b) Draw a detailed section of plinth through toilet area showing various elements [10]

**Q2)** Draw neat, labelled sketches on sheet for the following. (Any three) [15]

- a) Cross section through RCC Trapezoidal Footing showing reinforcement.
- b) Junction of RCC Beam fixed to RCC column.
- c) Sectional detail at Windowsill level showing provision made for Two-track Aluminium Sliding window
- d) Eccentric RCC footing and state its application.
- e) What is Cover block? Explain with sketches its use while casting different RCC members.

## SECTION-II

**Q3)** Answer any two draw sketches wherever necessary. [20]

- a) Explain Slump test in detail and draw the necessary tools needed to conduct the test.
- b) What is SBC of soil? Explain bulb of pressure and its significance in soil investigation.
- c) Explain step by step method to lay white marble floor in a Living room of ( $3.5\text{m} \times 4\text{m}$ ).
- d) State and sketch different elements that can be pre-casted. State advantages of Precast technology.

**Q4)** Write short notes any three of the following.

**[15]**

- a) Curing fo Concrete and methods used for curing slab.
- b) Explain the use of Steel in RCC. State different types of Steel used in RCC
- c) Methods of soil investigation.
- d) Process of manufacturing of Cement.
- e) Raft foundation.



Total No. of Questions :8]

SEAT No. :

**P1392**

[Total No. of Pages : 3

[6078]-76

**S.Y. B.Arch.**

**THEORY OF STRUCTURE-III**  
**(2019 Pattern) (Semester-III) (2201920)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question no.1 and 5 are compulsory in each Section. Any two out of Q.2,3,4 in section-I and any two out of Q.6,7,8 in section-II have to be solved.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data where necessary only.*
- 4) *Use M 25 grade concrete and Fe 500 grade steel.*
- 5) *Use of non- programmable calculators and standard steel tables of plastic design allowed.*

**SECTION-I**

- Q1)** A room of institutional building having clear size 7m×3.2m has to be covered with RCC simply supported slab resting on two beams having 230 mm width and 7 m length. Consider live load=4kN/m<sup>2</sup> and floor finish=1.25kN/m<sup>2</sup>. Use 12 mm diameter bars as main steel, 8 mm diameter as distribution steel. Write the answer in the form of schedule. Do not draw RCC details. **[11]**
- Q2)** A fixed beam of length 7m, carrying a UDL of 20kN/m over its entire span. It is also carrying a central point load of 18kN. Find support reactions and draw shear force and bending moment diagram. **[12]**
- Q3)** Design a simply supported RCC beam having effective length of 5.23m. The beam is supporting slab load of 4kN/m and wall load of 10kN/m. Calculate the self weight of beam and design the beam for all the loads mentioned. For flexure use 20 mm dia bars and for shear use 8 mm dia 2 legged stirrups. Width of beam is 230 mm. Consider wall thicknes of 230 mm. **[12]**

**P.T.O.**

Table 19 design shear strength of concrete,  $\tau_v$ , N/mm<sup>2</sup>

(Clauses 40.2.1, 40.2.2, 40.3, 40.4, 40.5.3, 41.3.2, 41.3.3. and 41.4.3)

$100 \frac{A_0}{bd}$	Concrete Grade				
	M 15	M 20	M 25	M 30	M 35
(1)	(2)	(3)	(4)	(5)	(6)
$\leq 0.15$	0.28	0.28	0.29	0.29	0.29
0.25	0.35	0.36	0.36	0.37	0.37
0.50	0.46	0.48	0.49	0.50	0.50
0.75	0.54	0.56	0.57	0.59	0.59
1.00	0.60	0.62	0.64	0.66	0.67
1.25	0.64	0.67	0.70	0.71	0.73
1.50	0.68	0.72	0.74	0.76	0.78
1.75	0.71	0.75	0.78	0.80	0.82
2.00	0.71	0.79	0.82	0.84	0.86

**Q4)** Answer any 3 of the following.

**[12]**

- State comparison of fixed beams and simply supported beam with respect to its bending behaviour, maximum deflection and static indeterminacy.
- Explain two cases in a building where a building element undergoes torsion.
- Explain the term water cement ratio and its importance.
- Explain importance of reinforcement steel.

## SECTION-II

**Q5)** For a short axially loaded RCC column subjected to factored load of 1100 kN having one dimension 300mm, find the dimensions' of column cross-section. Consider 1% steel. Find spacing of links. Make the schedule and draw a sketch of reinforcement details. **[11]**

**Q6)** A balcony is to be constructed for an office building using timber joist spaced at 2.2m c/c cantilevering out for a span of 1.2m. Size of block board is  $2 \times 1.2 \times 36$  mm thick. Use Indian oak for joist and flooring. Indian Oak has permissible bending stress  $12.16 \text{ N/mm}^2$ . Modulus of elasticity  $12.26 \times 10^3 \text{ N/m}^2$ , density  $8.48 \text{ kN/m}^3$ , permissible shear stress  $1.67 \text{ N/mm}^2$  and permissible deflection is  $L/150$ . **[12]**

**Q7)** For a room having size  $5 \text{ m} \times 3 \text{ m}$ , RCC simply supported slab has to be designed using limit state method. Consider load acting on slab as  $7.5 \text{ kN/m}^2$  including dead load, live load and floor finish. Slab is resting on 230 mm wide beams at four edges. No need for schedule or sketch. (Use 10 mm dia steel bars as main steel and 8 mm dia for distribution). **[12]**

**Q8)** Answer any three of the following: **[12]**

- a) Explain the slump cone test for concrete with sketch.
- b) Draw and explain standard RCC flexural section.
- c) Explain in detail the load distribution in a two way slab.
- d) Explain why alternate bars are bent up in a simple supported slab.





Total No. of Questions : 4]

SEAT No. :

P-1393

[Total No. Of Pages : 2

**[6078]-77**  
**S.Y.B.Arch.**  
**BUILDING SERVICES - I**  
**(Semester-III) (2019 Pattern) (2201923)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *Answer to section I and section II should be written in two separate answer sheets.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data if necessary.*

**Section - I**

**Q1)** Discuss how water tapped from the main roads? Explain municipal main cold water supply connection from main pipe to individual tap outlet with suitable sketches. **[15]**

OR

Explain and elaborate with neat sketches direct and indirect systems of hot water supply.

**Q2) Write short notes with neat sketches wherever necessary (Any 4): [20]**

- a) Discuss function and working of Globe valve.
- b) Enlist various pipes used for water supply based on material and function.
- c) Elaborate on Bio Gas Plant.
- d) Explain what is Calorifier and its function.
- e) Briefly explain wash basin, its function and working with sketches.
- f) Differentiate between Single stack system and Double stack system.
- g) Explain what do you mean by waste water, sewage and storm water. Explain separate and combined drainage systems at city level.

**P. T. O**

## Section - II

**Q3)** Explain working of a Septic tank with detailed plan and section of a septic tank. Discuss how the capacity and size of a septic tank is calculated. [15]

OR

What are the functions of traps? Draw and explain any two types of traps used in building sanitation system.

**Q4) Write short notes with neat sketches wherever necessary (Any 4): [20]**

- a) Explain solar PV Collector tube hot water system.
- b) Explain working of an Inspection Chamber.
- c) List various layouts of water distribution in a city with sketches.
- d) Discuss the function of an Anti-Siphonage pipe.
- e) Enumerate the various types of pumps and explain any two types with their working principle and cross-section.
- f) Discuss Bib tap and Pillar tap
- g) Explain the concept Rain water harvesting and methods of rain water collection.



Total No. of Questions : 4]

SEAT No. :

**P1394**

[Total No. of Pages : 2

[6078]-78

**S.Y.B. Architecture**

**BUILDING CONSTRUCTION & MATERIALS - IV**

**(2019 Pattern) (Semester - IV) (2201927)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data if necessary.*

**SECTION-I**

**Q1)** Draw any one of the following.

- a) A RCC dog legged staircase is to be built for a bungalow having 3.0 m height. The mid landing slab is at height of 1.5 m. analyze the structure as follows.
  - i) Draw plan of dog legged staircase showing necessary framing & reinforcement details. (1:10 scale). **[10]**
  - ii) Draw detailed section through mid-landing of staircase showing necessary reinforcement details. (1:10 scale). **[10]**

OR

- b) Asliding door is to be provided for a living room of a bungalow with opening size of 2.4m×1.2m.
  - i) Draw the plan, section & elevation to scale of 1 : 20. **[15]**
  - ii) Detail of assembly at bottom rail at 1 : 5 scale. **[5]**

**Q2)** Draw well labelled sketches of any 3 out of five given questions. **[15]**

- a) Stringer beam staircase.
- b) Sketch showing waterproofing at lintel level.
- c) Sketch of bay window.
- d) Draw the reinforcement for chajja through lintel.
- e) Precast staircase landing detail.

**P.T.O.**

## SECTION-II

**Q3)** Answer any 2 from the following questions. **[20]**

- a) Explain various methods of damp proofing along with sketch.
- b) Explain the procedure of external tanking for waterproofing of basement retaining wall.
- c) What are elevators? Explain its components in detail.

**Q4)** Write short notes on any 3 of the following. **[15]**

- a) What is LWC and discuss its application.
- b) Explain various types of plastic & its application in building industry.
- c) What is of Ferro-cement concrete? Explain its application in building industry.
- d) What are advantages & limitations of using RMC?
- e) Difference between damp proofing & water proofing.



Total No. of Questions : 8]

SEAT No. :

P-1395

[Total No. of Pages : 3

**[6078]-79**  
**S.Y. B.Arch.**  
**THEORY OF STRUCTURES - IV**  
**(2019 Pattern) (Semester - IV) (2201929)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) Question No. 1 and 5 are Compulsory in each Section. Any two out of Q.2, 3, 4 in Section I and Any two out of Q.6, 7, 8 in Section II need to be attempted.*
- 2) The Plan given at the end of question paper is for Q.1 and has to be attached with the answer sheet after marking answers on it.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data where necessary only.*
- 5) Use M 25 Grade concrete and Fe 500 grade steel.*
- 6) Use non-programmable Calculators and Standard Steel Tables of Plastic Design Allowed.*

**SECTION - I**

**Q1)** The plan of a Load Bearing Structure as shown in Figure 1 is attached at the end question paper. It has some basic flaws in transfer of load to the walls. Correct any four flaws in the plan and attach the plan with answer paper, indicating the corrections, such that its a feasible Load Bearing Structure. [9]

**Q2)** Design Doglegged staircase for the given data :

- a) Building is an office building.
- b) 10 Treads in each Flight of 300 each and Riser is 150 mm
- c) The width of Landing = Width of Flight = 1200 mm.
- d) The Staircase is supported of 230 mm wide. Beams on outer edges of the Landing.
- e) Consider Live Load = 4 kN/m<sup>2</sup> & Floor Finish = 1.25kN/m<sup>2</sup>.
- f) Use 12 mm diameter bars for main steel and 8 mm diameter bars for distribution (secondary steel).

**Write your answers in the Form of a Schedule. Do not draw Reinforcement Sketch.** [13]

**Q3)** Design a Steel Girder using ISMB for a Clear Span of 9m. UDL (service load) of 19 kN/m, simply supported on 230mm wide supports on each side. Select a Section for Flexure. Classify the Section Check for Shear Strength & Defection only. [13]

*P.T.O.*

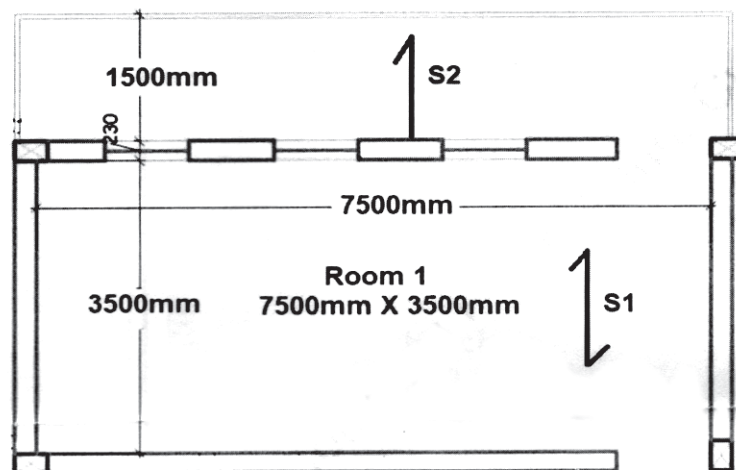
**Q4) Answer any 3 of the following :** [13]

- Explain why I.S. 456 does not permit the use of Over-Reinforced Sections.
- A Beam in R.C.C. is of Size 230mm × 450mm and is Reinforced with 4 no 20mm bars in one row, Find its Moment of Resistance.
- Draw RCC details of a section of three equal span continuous slab.
- Explain with sketch : Variour slabs and beam formations for balcony.

### SECTION - II

**Q5)** Design rectangular RCC Cantilever Beam of clear overhang length 2.8 m. This Beam is subjected to working loads of 15 kN/m and fixed to 230 mm support at one end. Consider width of beam 230 mm. Add self weight and design the beams for Flexure. **Do Not Design for Shear.** [9]

**Q6)** Design R.C.C. overhanging slab for the following sketch and details below. Consider Live Load = 3kN/m<sup>2</sup> and Floor Finish = 1.25 kN/m<sup>2</sup>. Use 10 mm diameter bars as main steel, clear cover of 25mm. Draw reinforcement details for the same. **No need to make a Schedule.** [13]

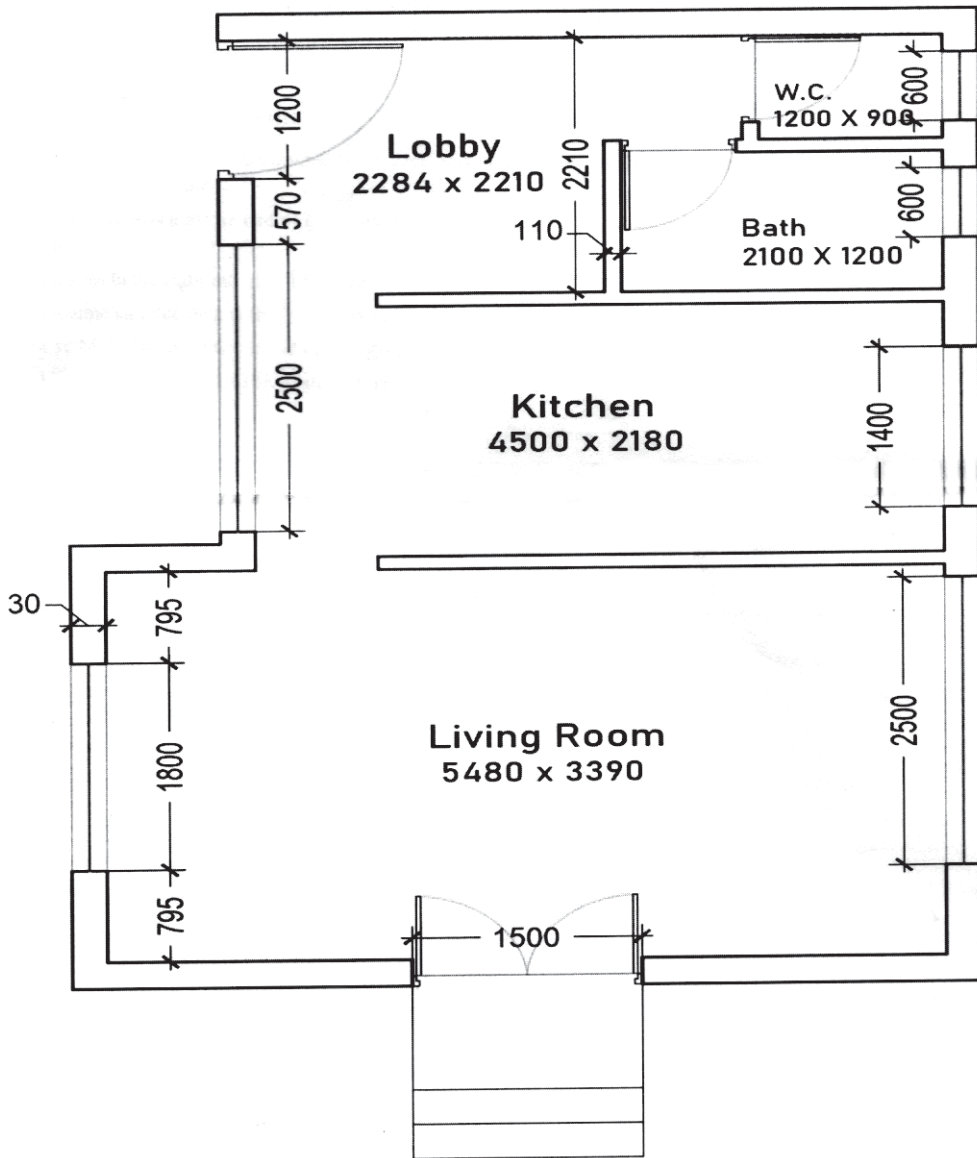


**Q7)** Design a steel stanchion using ISHB Sections for a compressive service load of 600 kN. Height of column is 5.5 m with one end hinged and other end fixed. Assume the design compressive stress ( $f_{cd}$ ) as 120 N/mm<sup>2</sup> to begin with. [13]

**Q8) Answer any three of the following :** [13]

- Explain any 4 Disadvantages of Steel Structures over Concrete Structures.
- Explain the Different Loads acting on a Steel Structure as per IS 800 2007.
- Draw and explain structural elements of a Typical Factory Building in Section.
- Define plastic Section Modulus and plastic Moment.

Q.1  
Fig1



All Dimensions are in mm



Total No. of Questions : 4]

SEAT No. :

**P1396**

[Total No. of Pages : 3

**[6078]-80**

**S.Y. B.ARCHITECTURE  
BUILDING SERVICES - II**

**(2019 Pattern) (Semester - IV) (2201932(P))**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer to Section I and Section II should be written in two separate answer sheets.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data if necessary.*

**SECTION - I**

**Q1)** Explain how Passive Building Strategies like Building orientation, Size of opening and Shading devices play an important role in admitting Day lighting in indoor spaces. **[15]**

OR

What is Refuse Chute? Explain with neat sketches a refuse chute system in high rise building.

**Q2)** Answer the following with neat labelled sketches wherever necessary (Any Four) **[20]**

- a) Write a note on Vermicomposting.
- b) Sketch and Explain working of Incandescent Lamp.
- c) Define Task Lighting and Mood lighting.
- d) What is Glare and which are the types of glare? How it is rectified?
- e) Write a note on Ambient Lighting.
- f) Write Lumen method equation and explain the terms involved in it.

**P.T.O.**



## SECTION - II

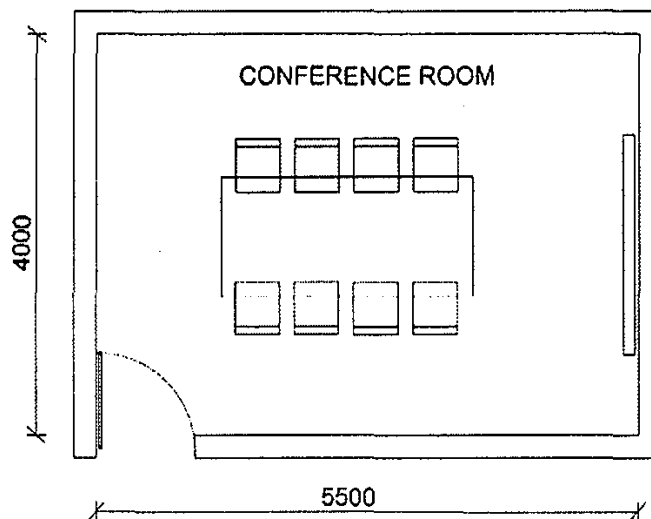
**Q3)** Write note on any 3 (Three) types of Wiring Methods, with neat sketches.[15]

OR

Draw a SKETCH of an Electrical Layout with a schedule of switch boards for a Conference room in an Office shown in attached figure to indicate following.

- General and Task Lighting
- Fan/s
- Computer point
- Projector point
- Plug points for Speakers

- Show -
- a) Light points and Switch boards in Wiring Layout
  - b) Index of symbols used
  - c) Schedule of Switch board



**Q4)** Answer the following with neat labeled sketches wherever necessary. (Any Four) **[20]**

- a) What is Plate Earthing? Explain its working.
- b) Sketch and explain working of a Lightning Conductor.
- c) Explain the working of CCTV and state benefits of CCTV installation.
- d) Explain the Installation of LAN cables through Flooring with neat sketches.
- e) Explain working of Step up Transformer with neat sketches.
- f) Explain working of Solar Photo Voltaic system and its benefits.

**x x x**

Total No. of Questions : 3]

SEAT No. :

P-1397

[Total No. of Pages :2

[6078]-81

T.Y. B.Arch.

**BUILDING CONSTRUCTION & MATERIALS - V**  
**(2019 Pattern) (Semester - V) (3201936)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *All questions are compulsory.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**(To be solved on drawing sheets only)**

**Q1)** Partition is proposed for two adjacent wall of recording studio of size 4.5 × 4.0 M with height of 3 M. The partition possesses an acoustical treatment. There is window opening of size 1.8M × 1.5M at a sill level of 0.90M to a longer wall. **[20]**

- a) Draw a plan of partition to the scale of 1:20
- b) Draw the section and elevation of partition with framing members to the scale of 1:20
- c) Draw details to suitable scale
  - i) Detail at window sill level & fixing with partition
  - ii) Partition detail at the corner where two partitions meet each other

OR

A small office of size 3.5M × 4M is to be provided with proprietary frame and panel false ceiling system.

- a) Draw a reflected ceiling plan at 1:20 showing framing system. Lighting system and AC diffuser grills.
- b) Draw a section to 1:20 scale through false ceiling
- c) Draw details of panel fixing and light fixing to suitable scale.

*P.T.O.*

**Q2)** Draw sketches of any three of the following : **[15]**

- a) Two joinery details constructed in hardwood
- b) Any two alternative details of fixing drawer in any furniture unit
- c) Two alternative details of fixing shutter to plywood cabinet
- d) Assembly of kitchen trolley

### **SECTION - II**

**(To be solved in answer books only)**

**Q3)** Write short notes of the following with neat sketches wherever necessary (Any Seven) **[35]**

- a) Any two types of varnishes
- b) Higher Density Fiberboard (HDF)
- c) Process of painting to newly constructed internal wall
- d) Post tensioning Slab
- e) Concept of ribbed slab and advantages
- f) Internal tanking in basement construction
- g) Any 2 defects in timber
- h) Cantilever Retaining wall
- i) Deep foundation for basement construction



Total No. of Questions : 8]

SEAT No. :

P-1398

[Total No. of Pages : 4

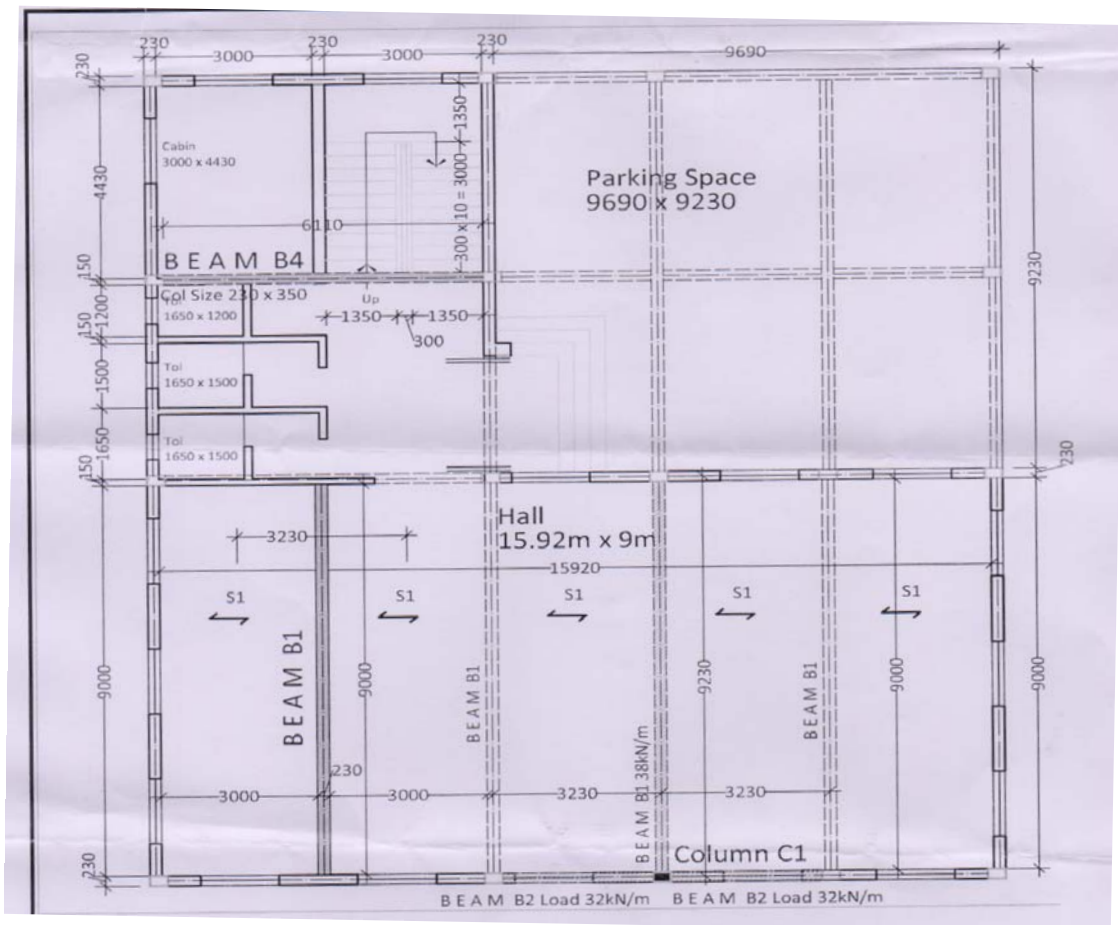
**[6078]-82**  
**T.Y. B.Arch**  
**THEORY OF STRUCTURES - V**  
**(2019 Pattern) (Semester - V) (3201938)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Question No 1 and 5 are compulsory answer any two question remaining in each section.
- 2) The plan given below applies to questions in both sections.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data where necessary only.
- 5) Use M 25 Grade concrete and fe 500 grade steel.
- 6) Every R.C.C design should be accompanied by relevant schedule and reinforcement sketch.
- 7) Use of non-programmable calculators and approved steel tables, is allowed.



P.T.O.

## SECTION - I

**Q1)** Find the Load acting on column C1 per floor. Assume Load on B1 to be 38kN/m and Effective Span = 9.23m and Load on B2 to be 32kN/m and Effective Span = 3.23m. Calculate Load on every Floor considering Parking + 5 Floors. Design Column of 230mm width on Third Floor using 1.5% steel and M25 Grade Concrete, Keep the Size same and Design Column on Second Floor. Make Schedule and Draw Sketch of reinforcement of both the columns. [13]

% Steel	M25	M30	M35
1	13.25Ag	15.23Ag	17.21Ag
1.5	14.875Ag	16.845Ag	18.815Ag
2	16.5Ag	18.46Ag	20.42Ag
2.5	18.125Ag	20.075Ag	22.025Ag
3	19.75Ag	21.69Ag	23.63Ag

**Q2) a)** Design the Beam B1 as a T Beam (Shown Dark Hatched) across Effective span 9.23m. Calculate Load (Do not take load as per q no 1). Take the overall depth to 550mm. Assume Slab Depth = 135mm of Slab S1. Take Live Load as 5kN/m<sup>2</sup>. Design for Flexure only. Assume N.A Position within Flange. [8]

b) Discuss the Situation Leading to Reversing Stresses in a Beam. [3]

**Q3) a)** Design Beam B4 (not shown in the sketch) as a Doubly Reinforced Beam of Clear Span 7.2m to carry an u.d.l of 36kN/m. Restrict the Overall depth to 550mm. Design for flexure only. Consider 2 rows of 20mm bars in Tension [8]

b) As per I.S.456 when can a beam be considered a T Beam [3]

**Q4) a)** Write Short Notes on any two of the Following drawing sketches wherever necessary. [8]

i) Pile Foundations - When Used and 3 Different Types and Applications

ii) Flat Slab Construction - Different Types

iii) 4 Situations in which the height of the beam has to be restricted

iv) Combined Footing - Need

b) Write a Short Note on Cellular Raft Foundation. [3]

### SECTION - II

**Q5) a)** Beam B1 (from main given plan) of Effective span 9.23m is to be replaced by IS MB 450 Calculate the load it can carry if welded with Flange Plates of 225mm x 15 mm on each side. Check for Shear Strength. [13]

**Explain Web Buckling and Web Crippling :**

OR

Calculate the Load taken by stanchion ISHB 350 @ 820N/m if it is welded with Flange Plates of 300mm x 25mm on each side. Length = 6800mm with one end fixed and the other end hinged in both Directions. [8]

b) Write a Short Note on Advantages of Castellated Girder [5]

**Q6) a)** An U.C.R Masonry wall is to be provided to retain Earth on its Vertical Face

Density of Retained Earth = 18kN/m<sup>3</sup>, Density of Masonary = 23kN/m<sup>3</sup>

Top Width of Wall = 1.2m, Take Bottom Width of wall = 0.6h

Height of Wall = 5.2m = h

Angle of Repose = 28°, Coefficient of Friction  $\mu = 0.6$ , S.B.C of Soil = 225kN/m<sup>2</sup>

**Check the Stability of the wall with respect to Overturning and Sliding** [8]

b) Write a Short Note on Weep Holes - Need and Provision. [3]

**Q7) a)** List the Dis- Advantages of Pre- Stressed Constructions over conventional R.C.C Construction. [3]

b) A Pre- stressed beam of size 230mm × 650mm is used as Beam B1 It carries an udl of 36kN/m over its entire span of 9.23m inclusive of its self-weight. It is pre-stressed by tendons supplying 2100kN force which are placed at 75mm below the neutral axis. Calculate the extreme fiber stresses at end span (support) and at mid span and End Span [8]

**Q8)** Design the Isolated Pad Footing of a Column 230mm × 700mm C1 to carry a load of Service Load of 1550kN in a Soil of S.B.C 250kN/m<sup>2</sup>. Assume 0.25% Steel and Design Shear Stress as 0.36N/m<sup>2</sup> for the assumed % of Steel. Do not Design or Check for Double Shear. [11]





Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

**P1399**

[6078]-83

**T.Y.B Arch.**

**BUILDING SERVICES-III**

**(2019 Pattern) (Semester-V) (3201941)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Answers to the sections should be written in separate answer books.*
- 4) *Figures to the right indicate full marks.*

**SECTION-I**

**Q1)** Explain in detail with sketches: (Anyone)

**[15]**

- a) What is Natural ventilation? Explain in detail the different methods to achieve natural ventilation in the building with appropriate sketches.

OR

- b) Calculate the number of exhaust fans required for basement to be used as an office measuring 8.00m × 10.00m × 3.20m. Show the position of fans in plan and section. Assume the appropriate air change required. You may choose fan from following .

Diameter of fan (mm.)	Air handling capacity of fan (Cu.m./Hr.)
305	1900
380	4000
457	6800
610	7900

**P.T.O.**

**Q2)** Write short notes on any four of the following: **[20]**

- a) Roof Pond.
- b) Centrifugal Fan.
- c) Factors affecting Human Comfort.
- d) Evaporative Cooling.
- e) Sensible Heat and Latent Heat.
- f) Psychrometric Chart.

**SECTION-II**

**Q3)** Explain in detail with sketches: (any one) **[15]**

- a) Describe the different types of Air conditioning systems along with neat and appropriate sketches

OR

- b) Explain Refrigeration cycle process, Components with neat and appropriate sketches.

**Q4)** Write short notes on any four of the following: **[20]**

- a) Any two types of filters used in air-conditioning.
- b) Types of AC ducting systems.
- c) Cooling Towers and its types.
- d) Central DX system.
- e) Air Handling unit.
- f) Vrv or Vrf Units In Air conditioning



Total No. of Questions: 8]

SEAT No. :

**P1400**

**[6078]-84**

[Total No. of Pages : 5

**T.Y. B. Arch.**

**THEORY OF STRUCTURES-VI  
(2019 Pattern) (Semester-VI) (3201947)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question 1 and Q. No. 5 are compulsory. Out of the Remaining three Solve any two in each section.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data where necessary only.*
- 5) *Use M25 Grade concrete and Fe 500 grade steel and L.S.M of Design in R.C.C Problems.*
- 6) *For Structural Steel Use Steel Fe410 (E250) whose  $f_y=250N/mm^2$ . Use L.S.M of Desing.*
- 7) *Every R.C.C Desing should be accompanied by relevant Schedule and Reinforcement Sketch.*
- 8) *Use of non-programmable Calculators Allowed.*
- 9) *Use of Approved Standard Steel Tables in LSM and wind Load Tables allowed.*

**SECTION-I**

**Q1) Compulsory. Answer any 2 From Q. No. 2,3 and 4.**

**[15]**

**Q1) Make the Framing Plan for the Given Ground Floor And First Floor. Framing Plan to be shown on Ground Floor Plan Only**

Show Columns only on Ground Floor, Size could be 230mm ×450mm

Show all Beams. Restrict Depth of Beams to 500mm. Indicate depth on plan and the Span to Depth Ratio considered for type of beam

Show spans of all Slabs and Indicate Depth Considered, Span to Depth Ratio. Slab depths to be restriced to 120mm.You need not show the beams and spans of Staircase Slab

No Columns to be provided within the Main Halls

*Window Positions are indicative only and could be changed to adjust for Column Positions.*

**P.T.O.**

**Q2)** A.R.C.C Cantilever Retaining wall is detailed as below.

- a) Top width of stem - 250mm Width of base - 3100mm S.B.C of soil - 250 kN/m<sup>2</sup>
  - b) Bottom width of Stem - 520mm thickness of base - 500mm Density of soil-18kN/m<sup>3</sup>
  - c) Height of stem - 5200mm Toe projection - 750 mm Coefficient of friction - 0.6
  - d) Density of Concrete - 25 kN/m<sup>3</sup> Angle of repose - 28°
- Check the stability of wall wrt Over turning and sliding [10]

**Q3) a)** Distances to be observed for Plate Tearing Failure in a Bolted Connection [3]

- b) Design a Purlin for the Following Data: [7]
  - i) Spacing of Trusses = 4.25m, Span of Truss = 15m and Height of Truss = 2.5m
  - ii) Roof Covering = G.I. Sheets
  - iii) Spacing of Purlins = 1.25m
  - iv) Neglect wind Load

Angle Section	Zezz in mm <sup>3</sup>
ISA 75x50x6	6700
ISA 75x50x8	8000
ISA 75x50x10	10400
ISA 75x50x12	12700
ISA 80x50x6	7500
ISA 80x50x8	9000
ISA 80x50x10	11700
ISA 80x50x12	14400
ISA 90x60x6	11500
ISA 90x60x8	15100
ISA 90x60x10	18600
ISA 90x60x12	22000

Angle Section	Zezz in mm <sup>3</sup>
ISA 100x65x6	14200
ISA 100x65x8	18700
ISA 100x65x10	23100
ISA 100x75x6	14400
ISA 100x75x8	19100
ISA 100x75x10	23600
ISA 100x75x12	27900
ISA 125x75x6	22200
ISA 125x75x8	29400
ISA 125x75x10	36300

Angle Section	Zezz in mm <sup>3</sup>
ISA 125x95x6	23100
ISA 125x95x8	30600
ISA 125x95x10	37800
ISA 125x95x12	44800
ISA 150x75x8	41700
ISA 150x75x9	51600
ISA 150x75x10	61200
ISA 150x115x8	44200
ISA 150x115x10	54900
ISA 150x115x12	65300
ISA 150x115x15	80400

**Q4)** Write short Notes with relevant sketches on any Two of the following. [10]

- a) Reinforcement Detailing in a Circular Water Tank with a Rigid joint at the Base.
- b) Dis-advantages of Welded Connection.
- c) Some parameters that will influence column Positions in a R.C.C. Building.
- d) Design the Reinforcement of the Stem in Question No. 2.

## SECTION-II

**Q5) Compulsory. Answer any 2 From Q. No. 6, 7 and 8.**

**Q5) A factory Building is to be Built over a Plinth Area of 15m×32m. [15]**

- a) Decide at what centre to center distance you will place the Stanchions to Support Roof Trusses. Accordingly Draw a key Plan Showing stanchions, Bracing System Used and Position of Bracing System.
- b) Use a Pratt Truss. Draw the Single Line Elevation of the Truss Showing Important Dimensions. Show Purlins and Purlin Spacing. Calculate the Live Load based on the angle of the Truss Suggest an Unequal Angle Purlin ( You may use Thumb Rules for the same)
- c) Suggest Angle Sections for Top Chord Members and Struts and Slings.
- d) Explain the Joint of the Truss and Stanchion as to a Sliding End and a hinged or Fixed End.

**Q6) Design a Compound Stanchion consisting of 2no ISMC placed front to front with a Battened Lateral System to take a load of 1100kN Height of the Stanchion is 8m, with both ends fixed in both directions. (Hint: Assume Stress = 200N/mm<sup>2</sup>). Assume End Battens of Size 200mm×8mm and intermediate Battens 150mm×8mm wide. Draw Sketch. [10]**

**Q7) Attempt Any Two. [10]**

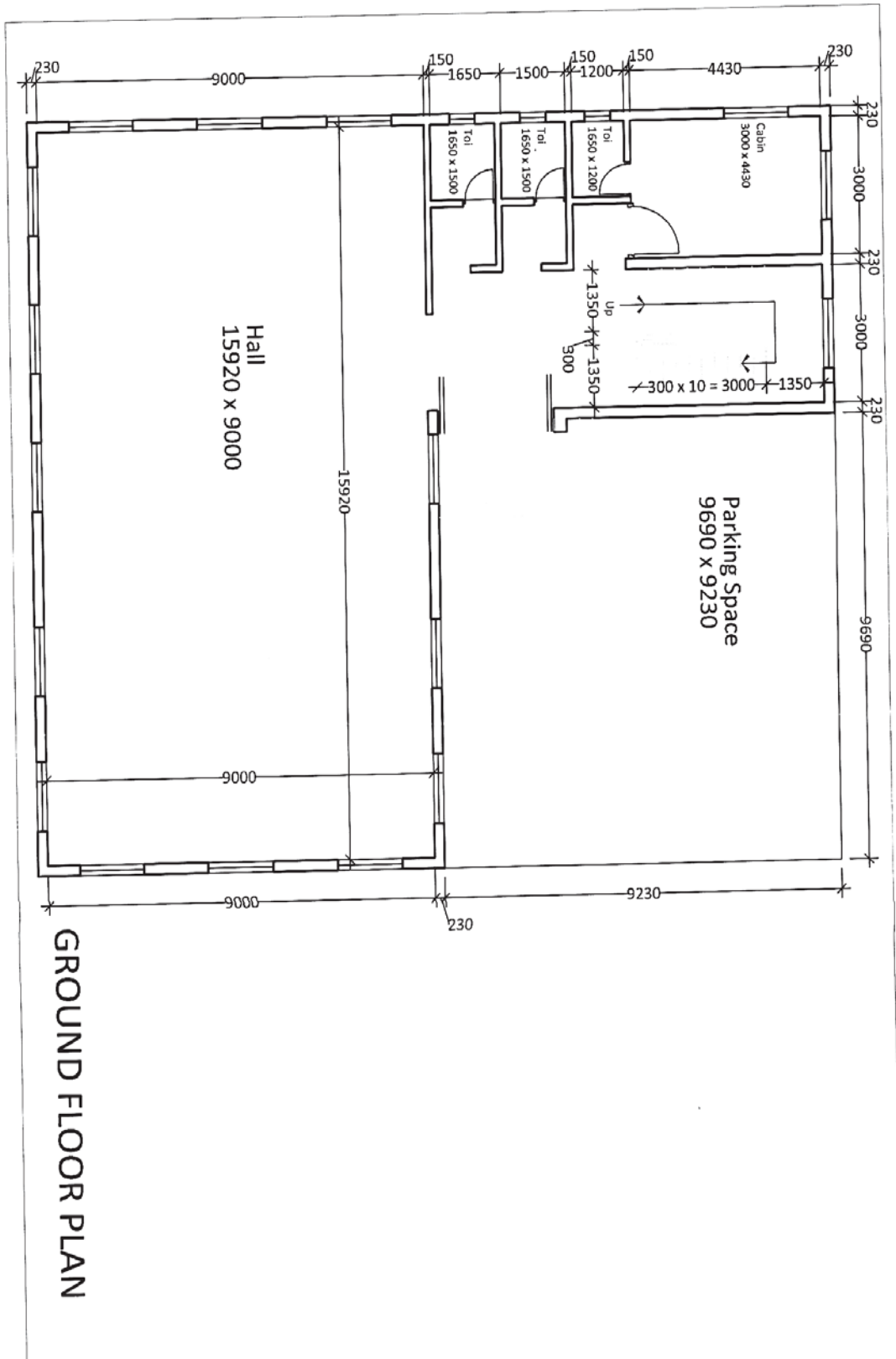
- a) Write a Short Note on Structural Action of Barrel Vaults
- b) Write a Short Note on any Structural System used in a High Rise Building
- c) Write a Short Note on Structural Action of RCC domes

OR

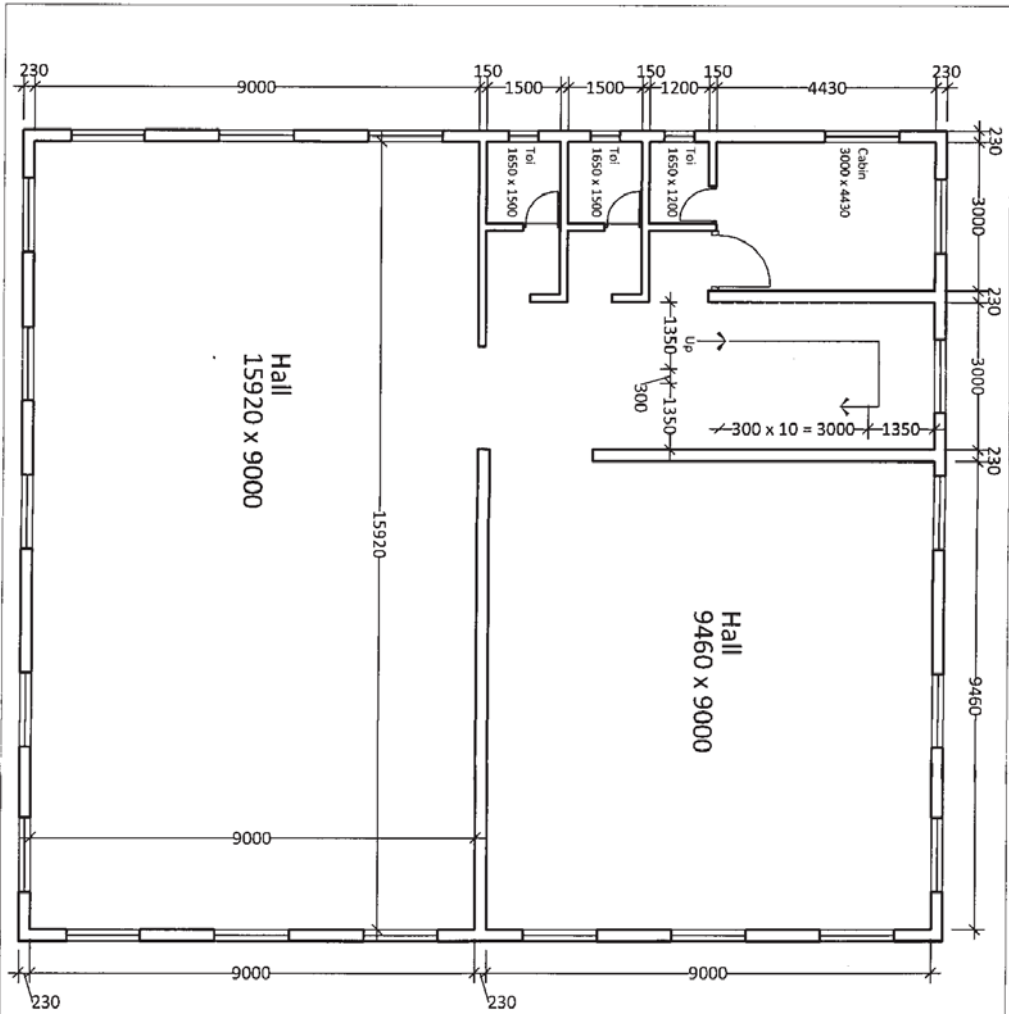
Design a Tension Member to take a Service load of 150kN. it is to be bolted with 20mm Bolts. Design the Bolted Connection. Use  $\beta = 1.08$  [10]

**Q8) Calculate Design equivalent static wind forces on an R.C.C Multistory building having size 11m×22m×30m located in Pune in a flat land Average storey height is 3m and frames are spaced at 5m c/c in both directions. The building is oriented with smaller dimension facing the wind. [10]**

V<sub>b</sub>=39m/s, k<sub>1</sub>=1, k<sub>3</sub>=1, k<sub>4</sub>=1, k<sub>d</sub>=0.9, k<sub>a</sub>=0.9, k<sub>c</sub>=0.95, c<sub>f</sub>=1.35. k<sub>2</sub> as per following table k<sub>2</sub>=0.91, 0.97, 1.01, 1.06 at height of 10m, 15m, 20m, 30m  
Calculate the Design Nodal Wind Load on all floors above the fifth floor  
Explain k<sub>3</sub>=Topography Factor



**GROUND FLOOR PLAN**



FIRST FLOOR PLAN



Total No. of Questions : 4]

SEAT No. :

P-1401

[Total No. of Pages : 2

[6078]-85

T.Y. B.Arch

**BUILDING SERVICES - IV**

**(2019 Pattern) (Semester - VI) (3201950)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Answer all questions.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1) a)** State any four acoustical defects & explain Sabin's formula used in calculating reverberation time to achieve good hearing condition in an enclosed space. **[15]**

OR

b) Explain Air borne sound and Structure borne sound and way of controlling air borne and structure borne with neat sketches. **[15]**

**Q2)** Write short notes on any FOUR of the following from. (Each 5 marks) **[20]**

- a) Dead Spot and Sound Foci.
- b) Indoor and Outdoor noise control.
- c) Reverberation Time.
- d) Microphone in sound reinforcement system.
- e) Sound amplification system.
- f) Echo and Acoustic Shadow.

**P.T.O.**



**SECTION - II**

**Q3) a)** Explain with the help of neat sketches, different type of sprinkler system and their advantages and disadvantages. **[15]**

OR

b) Explain with neat sketches list of different types of fire extinguisher used in firefighting system. **[15]**

**Q4)** Write short notes on any FOUR of the following. (Each 5 marks) **[20]**

- a) Refuse area
- b) Dry riser and Wet riser
- c) Fire signage explain any five
- d) Smoke Detector
- e) Classification of fire
- f) Fire Hydrants

**x      x      x**

SEAT No. :

[Total No. of Pages : 3]

P-1402

[6078]-86

**T.Y. B.Arch. (Semester - VI)**  
**ARCHITECTURAL DESIGN - V**  
**Design VI**  
**(2019 Pattern) (3201945)**

*Time : 12 Hours (Day 1 : Enlodge 6 hours)]*  
*(Day 2 : 6 hours)*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) Your Design responses shall be valued as a whole.*
- 2) Assume suitable standard data if necessary.*
- 3) The candidate must submit Layout Plan to 1:200 scale and schematic floor plans and sections to 1:100 scale at the end of first day. These sketches will not be returned.*
- 4) Single line sketch plans of the entire scheme with the site to the required scale shall be submitted by the students before or at the end of the First day.*
- 5) These drawings shall not be returned to the students. Therefore due record should be kept for subsequent time after the submission of the sketch design.*
- 6) The candidate should avoid considerable deviation from the sketch design submitted on the first day.*
- 7) The drawings should be self explanatory with structural scheme, graphics, nomenclature, dimensions, levels furniture layout clarity in all plans, sections and elevation.*
- 8) Skill of the drafting should have language of Architecture.*

**Primary School building at Ratnagiri**

Design Brief: A reputed educational institute is setting up a day school for pre-primary & primary stage (LKG, KG and 1st to 4th standards). This school is going to be affiliated to the state board Maharashtra. The school is being set up in an upcoming suburb of Pune. The school intends to develop students skills such as creativity, social responsibility etc.

The plot area of the project is 4725 sq.mt. With a 12 mt. wide road on the east side of the plot and 30mt wide road on the south side of the plot. Other details of the plot are as below.

1. Area of the plot - 105 mt. × 45 mt. = 4725 sqmt.
2. Maximum ground coverage - 945 sq.mt. (20% of plot area)
3. Set back from road - 6 mt.
4. Set back from all other sides - 4.5 mt.
5. Maximum height of building - 12.00 mt.

*P.T.O.*

Design space program :

Sr.No.	Description	No.	Area Sq M	Total Area Sq. M.
1	Reception and waiting	1	30	30
2	Principal's Cabin and Meeting Room	1	30	30
3	Administration with space for 2 Clerks, 1 Accountant	1	45	45
4	Classroom for 30 students with semi-open and open spaces	6	50	300
5	Multipurpose hall	1	200	200
6	Library including stacking and reading area	1	100	100
7	Labs: General Sciences and Computer	2	40	80
8	Arts and Crafts Room	1	45	45
9	Girl's Room	1	45	45
10	Boy's Room	1	45	45
11	Staff Room for 8nos with attached Toilets	1	80	80
12	Toilet for girls 3WC, 3WHB	-	adequate	
13	Toilet for Boys 3WC, 3WHB, 3urinals	-	adequate	

**TOTAL SPACE PROGRAM - CARPET AREA 1000 sq mts**

**Add 40% towards Circulation, Lobby, Public Toilets, Public Waiting spaces, Service areas, wall area etc. 400**

**TOTAL SPACE PROGRAM - BUILTUP AREA 1400 sq.mts**

Along with the above-mentioned design requirements the following facilities should be provided.

1. Amphitheater with a capacity of 100 seats
2. Open play ground area.
3. Semi open interactive spaces along with appropriate landscape elements.

## Parking Requirements

1. School bus parking - 2 buses
2. Four wheelers - 10 cars
3. Two wheelers - 20 Numbers

## SUBMITTALS GUIDELINES

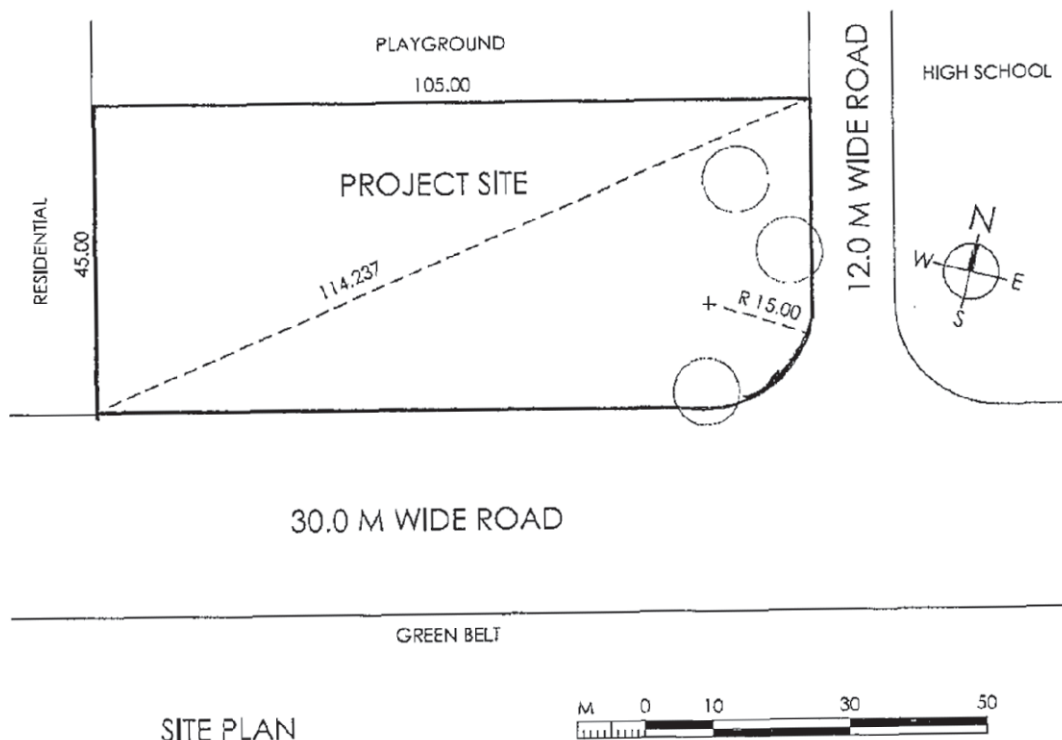
### a) First day submittal

1. Zoning plan with distribution of activities.
2. Site plan at 1:200 scale with location of built form - open space structure.
3. Section showing overall massing of building.

### Final Drawing requirements :

1. Site Plan. 1:200
2. All floor plans 1:100
3. Two sections minimum 1:100
4. Two elevations minimum 1:100  
(Roadside elevation is compulsory)
5. Sketch view showing qualitative aspects of built environment.

Note : All floor plans shall indicate various activities through internal furniture configuration



SITE PLAN



Total No. of Questions : 6]

SEAT No. :

**P1403**

[Total No. of Pages : 4

[6078]-87

**Fourth Year (B. Architecture)**

**QUANTITY SURVEYING & SPECIFICATION WRITING - I**

**(2019 Pattern) (Semester - VII) (4201958)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Solve section 1 and 2 in separate answer books.*
- 3) *Figure on the right hand side shows the maximum Marks for the question.*
- 4) *Assume suitable data wherever necessary.*
- 5) *Draw the required formats, Diagrams in the answer sheet wherever necessary.*
- 6) *Use of Logarithmic table, Electronic Scientific calculators, Steel table is allowed.*

**SECTION-I**

**Q1)** Answer the following.

**[3×5=15]**

- a) Write note on 'Importance of Estimation'?
- b) What is meant by 'Provisional Quantity'?
- c) What is the Data required for Estimation?
- d) What is meant by 'Direct cost'?
- e) Explain Five qualities of Estimator.

**Q2)** a) What is meant by Open, Restricted and Closed Specification? Give one example for each.

**[1×10=10]**

OR

- b) Explain, 'Role of Manufacturer's Guide in material purchase procedure.

**Q3)** Work out the quantities of items mentioned below based on enclosed drawing 'A'.

**[2×5=10]**

- a) PCC in foundation wall base.
- b) Foundation masonry (above ground only).
- c) PCC at plinth top.
- d) 230mm thick rubble soling in plinth.

**P.T.O.**

## SECTION-II

**Q4)** Work out the quantities of items mentioned below based on enclosed drawing 'B'. **[3×5=15]**

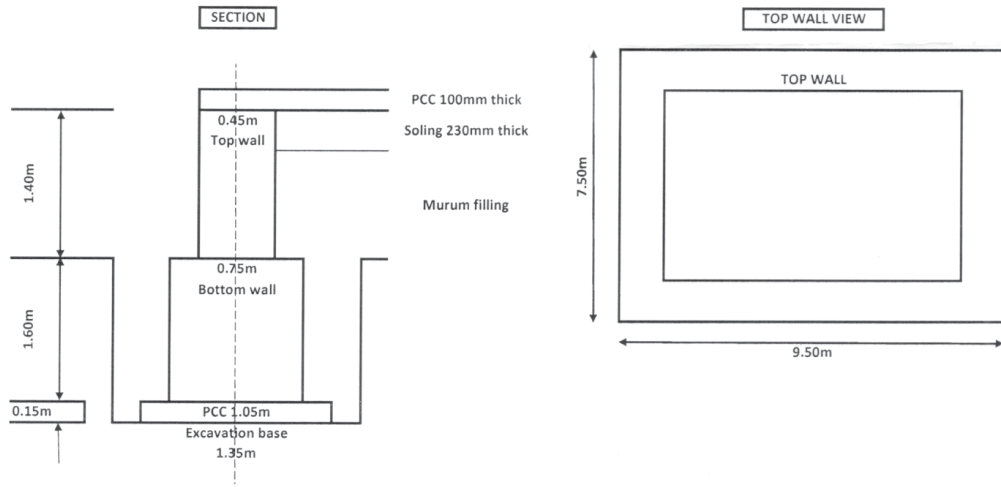
- a) RCC column in ground floor (All).
- b) RCC chajjas (All).
- c) Internal plaster to wall & ceiling for Bed rooms only.
- d) Aluminium windows & ventilators (All).
- e) Wall tile work for WC & Bath upto 2. 10m height.

**Q5)** Write short note on Material/Workmanship specification. **[3×5=15]**

- a) Write the rules for 'Deductions in plaster work' as per IS code 1200.
- b) Write workmanship details for internal plaster to wall & ceiling.
- c) Write material specification for floor tiles.
- d) Write workmanship specification for 'Roof slab waterproofing'.
- e) Write properties of good quality sand.

**Q6)** Write mode of measurements for items of building work as per IS-1200. **[5×1=5]**

- a) Rubble soling in plinth.
- b) RCC slab beam.
- c) Reinforcement steel work.
- d) 115mm thick brick masonry.
- e) Gypsum finish wall plaster.
- f) Shahabad flooring.
- g) Brick bat waterproofing for WC sunk.
- h) Excavation in wall trench.



DRAWING 'A'





Total No. of Questions : 10]

SEAT No. :

P-1404

[Total No. of Pages : 2

[6078]-88

Fourth Year B.Arch.

PROFESSIONAL PRACTICE

(2019 Pattern) (Semester - VII) (4201959)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answers to the two Sections - I & II - must be written on Separate Answer Books.
- 2) Answers to Q.1 from Section-I and Q.6 from Section-II are Compulsory.
- 3) Attempt Any Two out of the remaining Questions in Each section.
- 4) Figures to the right of each Question indicate Full Marks.

**SECTION - I**

**Q1) Write a comprehensive note on THE ARCHITECTS ACT of 1972, highlighting its salient features, and comment on its impact on Architects Profession. [11]**

**Q2) Write Short Notes on Any Two of the following : (6 Marks Each) [12]**

- a) Composition and Layout of an Architects Office. [6]
- b) Architects Agreements with other Consultants. [6]
- c) Professional Fees for Architectural services. [6]
- d) Stages of Architects work from Design to Completion. [6]

**Q3) Comment on Any Two of the following : (6 Marks Each) [12]**

- a) Registration of Architects. [6]
- b) Architects professional Fees. [6]
- c) Civic and Social activism by Architects. [6]
- d) Professional mis-conduct. [6]

P.T.O.

**Q4)** Write a comprehensive note on **The Indian Institute of Architects**, giving its History in brief and its Role and Activities as an Institution of Architects.[12]

**Q5)** What and Where is the **Council of Architecture**? Who are the Members of the Council of Architecture and how are they appointed? [12]

### SECTION - II

**Q6)** Write a comprehensive note on the **SCALE OF ARCHITECTS PROFESSIONAL FEES and the Stages of Payment.** [11]

**Q7)** Compare and Contrast Any Two of the following (6 marks each) : [12]

- a) Income Tax and Goods and Service Tax. [6]
- b) Freehold and Leasehold Land Tenure of Land. [6]
- c) Savings Account and Current Account. [6]
- d) Proprietary and Partnership Practice. [6]

**Q8)** Write a comprehensive note on the **CODE OF CONDUCT** for Architects.[12]

**Q9)** What is **THE ROLE OF AN ARCHITECT** in a Construction Contract? Discuss the Architects status and his duty with respect to Speed, Quality and Economy. [12]

**Q10)** Write Short Notes on **Any Two** of the following (6 marks each) : [12]

- a) Architects professional Liabilities. [6]
- b) Arbitration by Architect. [6]
- c) Site Visit Reports by Architects. [6]
- d) Importance of Insurance for Architects. [6]



Total No. of Questions: 6]

SEAT No. :

**P1405**

**[6078]-89**

[Total No. of Pages :4

**Fourth Year B. Arch.**

**QUANTITY SURVEYING & SPECIFICATION WRITING-II  
(2019 Pattern) (Semester-VIII) (4201965)**

*Time :2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Solve section I and II in separate answer books.*
- 3) *Figure on the right hand side shows the maximum Marks for the question.*
- 4) *Assume suitable data wherever necessary.*
- 5) *Draw the required formats, Diagrams in the answer sheet wherever necessary.*
- 6) *Use of Logarithmic table, Electronic Scientific calculators, Steel table is allowed.*

**SECTION-I**

**Q1) a)** What is rate analyse and what are the factors affecting Rate analysis.

**[1×10=10]**

OR

b) Write the difference between direct cost and indirect cost.

**Q2) A)** Answer the following (Any Two)

**[2×5=10]**

- a) Prepare rate analysis for Filling in plinth with murum
- b) Prepare rate analysis for PCC (1:1.5:3)
- c) Prepare rate analysis for Vitrified tile flooring
- d) Prepare rate analysis for 230 thk Burnt Brick Masonry

***Material Rates***

- 1) *Cement – Rs. 320/- per Bag*
- 2) *Crush Sand – Rs. 1150/- per Cu.M.*
- 3) *Stone Metal – Rs. 1050/- per cu.M.*
- 4) *Murum – Rs. 600/- per Cu.M.*
- 5) *River Sand – Rs. 3175/- per Cu.M.*
- 6) *Vitrified Tile – Rs. 700/- per Sq. M.*
- 7) *Burnt Bricks– Rs. 15/- per number*

**P.T.O.**

### ***Labour Rates***

- 1) *PCC (1:1.5:3) – Rs. 1500/- per Cu.M.*
- 2) *Brick Masonary – Rs. 1400/- per cu.M.*
- 3) *Skilled worker – Rs. 800/- per Day*
- 4) *Unskilled worker - Rs. 600/- per day*
- 5) *Tile Flooring – Rs. 375/- per Sq.M.*

B) Answer the following (Any One) **[1×5=5]**

- a) Prepare indent of material for 115 mm thick burnt brick masonry for a quantity of 10 Sqmt.
- b) Prepare indent of material for PCC 1:2:4 for a quantity of 15 cumt.

**Q3)** Answer the following (Any Two) **[2×5=10]**

- a) Prepare a checklist for RCC column in ground floor
- b) Write short note on Mason as a trade
- c) Write a short note on importance of Check list
- d) What is Day work?

### **SECTION-II**

**Q4)** Workout Quantities of the following items from the Fig.1 attached (Any Three) **[3×5=15]**

- a) Principle rafters
- b) Tie members
- c) Roofing sheets
- d) All struts
- e) Purlines

Q5) Answer the following (Any Two)

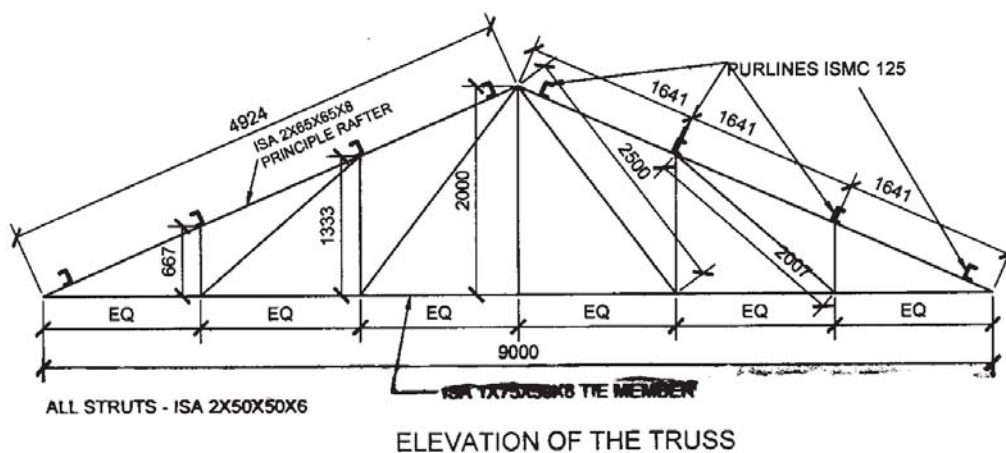
[2×5=10]

- Write specifications for Water supply in a ground storey bungalow
- Write specifications for Passenger Elevator
- Write specifications for ramp for disabled persons
- Write specifications for Acoustical panels for auditorium

Q6) Write names of the manufacturers of the following. (All Ten)

[10×1=10]

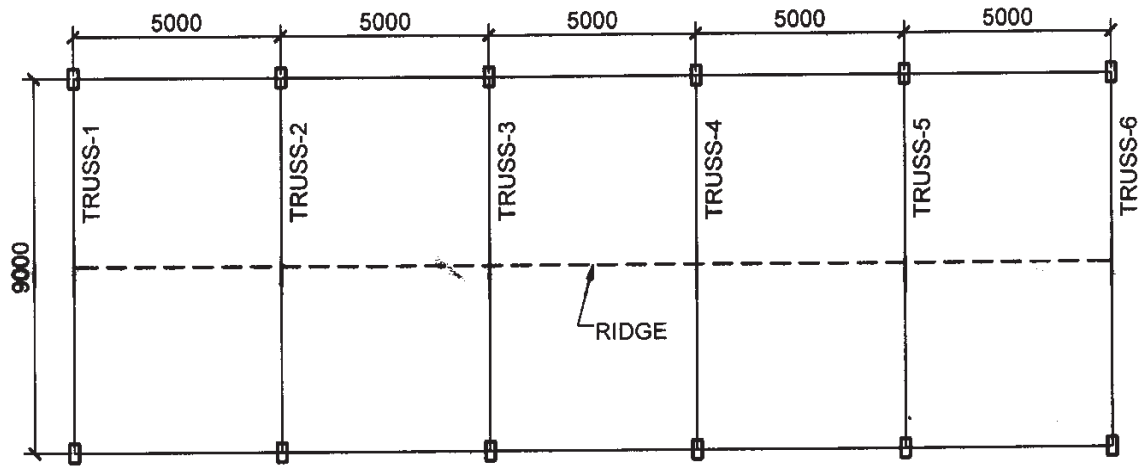
- Sanitary Fixtures
- UPVC pipes
- Electrical switches
- Air conditioners
- Elevator
- Escalator
- LED light fittings
- Electrical cables
- Cp plumbing fittings
- Cement



ELEVATION OF THE TRUSS

WEIGHT PER RMT FOR STEEL MEMBERS

- 75X50X8 = 7.40 kg/mt
- 65X65X8 = 7.70 kg/mt
- 50X50X6 = 4.50 kg/mT
- PURLINES - ISMC 125 = 13.10 kg/mt



SCHEMATIC PLAN OF THE FACTORY SHED

FIG. - 1



Total No. of Questions : 8]

SEAT No. :

**P1406**

[Total No. of Pages : 2

[6078]-90

**Fourth Year B.Arch.**

**PROJECT MANAGEMENT**

**(2019 Pattern) (Semester-VIII) (4201966)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer to the two sections are to be written in separate answer books.*
- 2) *Q.no.1 is compulsory question in section I and Qno.5 is compulsory question in section II*
- 3) *Answer any two question of question no 2,3 and 4 in section I and any two questions of Question no 6.7 and 8 in section II.*
- 4) *Figures to the right indicate full marks.*

**SECTION-I**

(Q.No.1 compulsory. Answer any 2 of Q. No. 2.3 and 4)

**Q1)** Explain the 5M's of construction management with the role of architect in each of them. **[11]**

**Q2)** Write short notes on any 3 of the following. **[12]**

- a) Compare between traditional and modern project management.
- b) Explain internal project environment with examples.
- c) Define collaboration and explain its importance.
- d) Compare between policies and procedures.
- e) Define project, program and portfolio.

**Q3)** Answer any 2 questions of the following: **[12]**

- a) Explain any two project phases with their importance.
- b) Processes in construction project planning phase.
- c) Define feasibility study and types of surveys undertaken for finalizing a project.
- d) Difference between project and construction management.

**P.T.O.**

- Q4)** Answer any 2 questions of the following: [12]
- Explain the knowledge area of project time management w.r.t importance need and the involved PMP.
  - Explain the knowledge area of project quality management w.r.t importance, need and the involved PMP.
  - Explain architect's role in maintaining quality of construction, list with help any 6C's.

## **SECTION-II**

(Q.No. 5 compulsory. Answer any 2 of Q. No. 6.7 and 8)

- Q5)** Explain unrestricted open tender and two Envelope open Tender w.r.t system. Application, Advantages and Disadvantages and selection of contractor. [11]

- Q6)** Write short notes on any 3 [12]
- B2 type tender w.r.t. method, where used, and how does the contractor Quote.
  - Security Deposit Account.
  - Interim R.A. Bills of work.
  - Clerk of works.
  - Latent and patent defects with examples.

- Q7)** Answer any 3 questions of the following. [12]
- What should be the frequency of site visits and what is to be observed and noted by The architect during his visit to A site.
  - Introduce the knowledge area of project risk management and list the PMP involved.
  - Benefits of using project management softwares
  - Validity of architect's instructions.

- Q8)** Explain any 3 of the following. [12]
- Process of construction safety management.
  - Types and function of financial management?
  - Areas and applications of Design Management.
  - Identify the Hazards on a construction site.

