

SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK



VIII SEMESTER

1903803 PREFABRICATED STRUCTURES

**REGULATION 2019
ACADEMIC YEAR 2024-2025**

Prepared by

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1903803 PREFABRICATED STRUCTURES VALUATION



SEMESTER: 8th

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UNIT 1 – INTRODUCTION

Need for prefabrication – Principles of prefabrication – Modular coordination –Standardization –Materials– Systems – Production – Transportation -Prefabrication of load carrying members – Disuniting of structures – Erection

Q.No	PART A	BT	COMPETANCE
1	Define Prefabrication.	BT-1	Remember
2	Why disuniting of structures is necessary in prefabricated structures?	BT-1	Remember
3	Give the different types of Modular Grids	BT-1	Remember
4	List out the limitations of modular coordination in Precast Elements.	BT-1	Remember
5	List out the System of Prefabrication.	BT-1	Remember
6	List out the advantages and disadvantages of prefabricated system	BT-1	Remember
7	Discuss about Production process.	BT-2	Understand
8	Describe the aims of prefabrication.	BT-2	Understand
9	Distinguish between site prefabrication and plant prefabrication	BT-2	Understand
10	Summarize the erection procedure for PFS building	BT-2	Understand
11	Classify the methods for Manufacture of precast concrete elements.	BT-2	Understand
12	Write the factors which affect the loading connection in demoulding and transport of components.	BT-2	Understand
13	Write the need for prefabrication.	BT-2	Understand
14	List the types of Prefabrication.	BT-1	Remember
15	Discuss about the conveyor belt or production line system production technique.	BT-3	Apply
16	State the Principles of Modular coordination Concept.	BT-1	Remember
17	Define the term Standardization and mention its advantages and uses in prefabrication.	BT-2	Understand
18	Generalize the factors which affect the loading conditions in demoulding and transport of components?	BT-3	Apply
19	What are the equipments generally used for hoisting of prefabricated components.	BT-1	Remember
20	Expand the characteristics of materials used for construction of PFS?	BT-1	Remember
21	What are the limitations of prefabrication?	BT-2	Understand
22	What are the disadvantages of disuniting of structures?	BT-1	Remember
23	List the various transporting device used in prefabrication construction.	BT-2	Understand
24	What are the steps to be followed in the erection of prefabricated structures?	BT-1	Remember
25	At what point in the members disuniting should be done?	BT-1	Remember

PART –B

1.	What are the different types of Structural Systems used in Prefabricated Structures? Explain	BT-1	Remember
2.	What are Erection Stresses? How they are Reduced or Eliminated?	BT-3	Apply
3.	Describe in detail about the Different Materials used the Principle and need of Prefabrication.	BT-3	Apply
4.	Explain in detail about the concept of Precast concrete building.	BT-3	Apply
5.	Illustrate the production process of prefabricated structural elements.	BT-2	Understand
6.	Explain the important aspect considered during hoisting, erection and transportation of precast element.	BT-3	Apply
7.	Explain in detail about the concept of modular coordination and State its significance in prefabricated structures.	BT-4	Analyze
8.	Explain the necessity of disuniting of structure sand explain in detail with sketch	BT-2	Understand
9.	Summarize the Transporting and hoisting of Prefabrication.	BT-2	Understand
10.	Explain the merits and demerits of prefabrication systems.	BT-3	Apply
11.	Discuss the different types of Structural system of prefabrication used in prefabricated structures.	BT-4	Analyze
12.	(i) Enumerate the need of prefabrication. (7 marks) (ii) Erection process (6 marks)	BT-5	Evaluate
13.	Explain the principle of prefabrication.	BT-2	Understand
14.	Briefly explain the steps involved in Erection Process.	BT-4	Analyze
15.	Explain in detail about prefabricated materials.	BT-4	Analyze
16.	Differentiate Prefabricated Structures and Conventional Structures.	BT-2	Understand
17.	What are the different types of Structural Systems used in Prefabricated Structures? Explain	BT-2	Understand

PART – C

1	Generalize the steps involved in the process of disuniting of prefabricated structures and What are the precautions taken during the disuniting the Structures?	BT-4	Analyze
2	Discuss the process of production, transportation and erection of prefabrication	BT-2	Understand
3	Explain the production process with a flow chart describing the process	BT-4	Analyze
4	What are the methods for Manufacture of precast concrete elements and explain the factors influencing method of manufacturing?	BT-4	Analyze
5	Discuss basics, principles and advantages of Modular Coordination.	BT-2	Understand

UNIT II - PREFABRICATED COMPONENTS

Behaviour and types of structural components – Large panel systems – roof and floor slabs – Walls panels - Beams - Columns - Shear walls

PART-A

1	Define Shear wall and list its functions.	BT-1	Remember
2	Define Long Wall System	BT-1	Remember
3	What are the loads acting on wall panel members?	BT-1	Remember
4	How are precast floors classified?	BT-1	Remember
5	List out the prefabricated structural units.	BT-1	Remember
6	Write short note on cross walls.	BT-1	Remember
7	Differentiate between synclastic and Anticlastic?	BT-2	Understand
8	Write about Prefabricated Roofing and flooring elements	BT-2	Understand
9	Discuss about dome structure	BT-2	Understand
10	Discuss about box type construction.	BT-2	Understand
11	Classify the precast concrete walls	BT-3	Apply
12	Give classification of wall panels	BT-3	Apply
13	How are roofing members in prefabricates classified?	BT-3	Apply
14	List the different classification of shear walls	BT-2	Understand
15	Mention the types of prefabricated structural elements	BT-1	Remember
16	Expand the surface forming members.	BT-2	Understand
17	Enumerate the classification of floor slabs.	BT-2	Understand
18	Prepare the necessity of dimensional tolerances.	BT-1	Remember
19	What is ring system?	BT-2	Understand
20	List out the recommended lateral load resisting elements in a building	BT-1	Remember
21	What are the types of structural and non-structural prefabricated components?	BT-2	Understand
22	Expand the term lift-slab construction.	BT-3	Apply
23	Discuss about the basic principles in the construction of shear wall.	BT-2	Understand
24	List the types of structural grids.	BT-3	Apply
25	What are the advantages of using large roof panels?	BT-3	Apply

PART-B

1	Explain the methods of construction of roof and floor slab.	BT-2	Understand
2	Describe in detail about large panel construction with neat sketch.	BT-2	Understand
3	Describe in detail about exterior and interior wall construction with neat sketches.	BT-3	Apply
4	Explain the precautions taken during the manufacturing process of roof slab.	BT-3	Apply
5	i) Describe the manufacturing Process of wall panels (7marks) ii) With the Flow chart explain the manufacturing process of roof and floor slabs (6marks)	BT-4	Apply
6	Classify the structure of building based on the load distribution and briefly explain the different types of such prefabricated building.	BT-4	Apply
7	Compare the column Structures with Shell structures	BT-2	Understand
8	Discuss about RC hollow concrete block masonry walls.	BT-2	Understand
9	Discuss about behavior of columns in prefabricated structures.	BT-3	Apply

10	Explain about the warped surface and Domes in detail.	BT-4	Apply
11	Explain the process involved in prefabrication of columns	BT-4	Analyze
12	Discuss about behavior of conventional and prefabricated structural components.	BT-3	Apply
13	Explain the behavior of roof and floor slab construction with suitable sketches.	BT-3	Apply
14	i) Write briefly about types of wall panels. (7 marks) ii) Write a brief notes on Column structures. (6 marks)	BT-2	Understand
15	Explain different types of panel systems.	BT-2	Understand
16	Explain in detail about prefabricated components.	BT-3	Apply
17	Differentiate the behavior of frame and large panel construction in precast structures.	BT-2	Understand

Part- C

1	Explain the behavior of large panel construction with suitable sketches.	BT-2	Understand
2	Write about the structural behavior of precast structure.	BT-4	Analyze
3	Describe different types of wall panels based on the materials.	BT-5	Evaluate
4	What is the necessity of providing shear walls in the precast structures? Discuss the different types of shear walls.	BT-3	Apply
5	Elaborate the recommendations for the detailing in the precast element in respect of the connections and erection of Structural slab and wall system	BT-3	Apply

UNIT - III DESIGN PRINCIPLES

Design philosophy- Design of cross section based on efficiency of material used –Problems in design because of joint flexibility – Allowance for joint deformation -Demountable precast concrete systems.

PART-A

1	What is joint flexibility?	BT-1	Remember
2	What are the Loads acting in wall panels?	BT-1	Remember
3	How the material used in construction does affect the design of the element?	BT-3	Apply
4	Discuss joint deformation?	BT-1	Remember
5	What is dimensional tolerances?	BT-2	Understand
6	Define expansion joints	BT-2	Understand
7	Mention the design codes for precast units.	BT-1	Remember
8	How does the material used in construction affect the design of floor Slabs?	BT-2	Understand
9	Write about the failure of joints	BT-2	Understand
10	Compare the joint deformation and joint flexibility	BT-2	Understand
11	Write the maximum allowable deflection limit for roof slabs undershort term loads.	BT-2	Understand
12	Classify the Types of walls	BT-1	Remember
13	Why should we give allowance for joint deformation?	BT-2	Understand
14	Distinguish between Concrete wall and Shear Wall.	BT-2	Understand
15	Discuss about the expansion joint and flexibility joint.	BT-2	Understand
16	List the problems in design because of joint flexibility.	BT-2	Understand
17	Generalize the assumptions which made for concrete Walls.	BT-2	Understand
18	Compose the different types of tolerances adopted in precast	BT-1	Remember
19	Explain briefly about the suitable design of cross section based on efficiency.	BT-3	Apply
20	Define Demountable precast concrete systems	BT-3	Apply

21	Write the structural design considerations in design of precast construction.	BT-1	Remember
22	Write the uses of bearing pads.	BT-2	Understand
23	Mention the important requirements of joint flexibility.	BT-2	Understand
24	List the factors considered for designing expansion joint.	BT-1	Remember
25	Write down the advantages of using epoxy resin in prefabricated construction.	BT-1	Remember

PART-B

1	What is joint flexibility and allowance for joint deformation? Explain problems in design	BT-3	Apply
2	Explain the problems in design because of joint flexibility.	BT-2	Understand
3	Explain the problems in design of joint flexibility, Discuss with regard to various locations.	BT-2	Understand
4	Explain in detail about the Demountable precast concrete systems	BT-2	Understand
5	Explain in detail about the suitable design of cross section based on efficiency.	BT-2	Understand
6	What is the signification of tolerance in precast buildings? Explain different types of tolerance adopted in precast constructions.	BT-2	Understand
7	Enumerate the salient points considered while designing a joint and also discuss the importance of joint flexibility	BT-2	Understand
8	Design procedure for corbels, Concrete walls & its assumptions.	BT-3	Apply
9	Explain how the material selection impacts the design efficiency of a precast element.	BT-2	Understand
10	Enumerate the salient points considered while designing a joint and also discuss the importance of joint flexibility.	BT-1	Remember
11	Is a Prestressed structure efficient in reducing the demand of material and cost? If so-explain.	BT-5	BT-3
12	Describe why structural analysis is to be done for precast structures	BT-4	Analyze
13	List out the key processes and Roles in precast construction and explain in detail.	BT-2	Understand
14	(i) Analyse how the structures are being grouped . (7 marks) (ii) How the prefabricated members are joined? (6 marks)	BT-4	Analyze
15	Explain detail about the suitable design of cross section based on efficiency of materials.	BT-3	Apply
16	How do the design principle of precast structures differ from cast in situ structures? Explain.	BT-4	Analyze
17	Describe briefly about the allowance for joint deformation.	BT-2	Understand

PART- C

1	Explain the steps involved in the design of prefabricated structures.	BT-2	Understand
2	Discus about the locations of structures that are involved in the design because of joint flexibility	BT-2	Understand
3	Why should we give allowance for joint deformation? Explain in detail.	BT-5	Evaluate

4	Write the detail about design of cross section based on efficiency of the materials.	BT-4	Analyze
5	Explain the steps involved in the process of Demountable precast concrete systems	BT-2	Understand

UNIT-IV: JOINTS AND CONNECTIONS IN STRUCTURAL MEMBERS

Types of Joints – based on action of forces - compression joints - shear joints - tension joints based on function - construction, contraction, expansion. Design of expansion joints Dimensions and detailing - Types of sealants - Types of structural connections -Beam to Column - Column to Column- Beam to Beam - Column to foundation.

PART –A

1	List the different types of connections?	BT-1	Remember
2	What are the different types of joints?	BT-1	Remember
3	What are the materials used for concrete joints?	BT-1	Remember
4	Give any two types of joints in prefabricated structures.	BT-3	Apply
5	Write any 2 characteristics of expansion joint.	BT-1	Remember
6	What is meant by Tolerance?	BT-1	Remember
7	Discuss the importance of joints in precast structures when compared to cast- in-situ structures?	BT-2	Understand
8	What are the connections?	BT-2	Understand
9	What are the functions of joints?	BT-2	Understand
10	How will you connect a precast column with precast foundation	BT-3	Apply
11	Show the different connections made in a prefabricated structure	BT-1	Remember
12	What is the significance of connections in precast construction?	BT-1	Remember
13	Give the formula for design temperature change	BT-1	Remember
14	Based on the location within a building, how connections can be classified?	BT-2	Understand
15	State whether the precast structure need an expansion joint.	BT-2	Understand
16	Expand the connection system for post tensioned elements.	BT-3	Apply
17	Evaluate the points to be considered while designing the connections?	BT-3	Apply
18	Generalize the significance of connections in precast structures?	BT-1	Remember
19	Differentiate the joints and connections in a precast structure with a clear sketch.	BT-1	Remember
20	Draw a joint connecting wall panel with a frame	BT-1	Remember
21	Define post tensioned connections.	BT-1	Remember
22	Describe about column pocket connection.	BT-1	Remember
23	What are the different types of beam and column connections?	BT-1	Remember
24	Describe shear key connections.	BT-2	Understand
25	Define bearing pad.	BT-1	Remember

PART –B

1	Give the recommendations for the detailing the precast	BT-1	Remember
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	settlement in respect of the Connections and erection.		
2	Explain different types of joints used in precast construction	BT-1	Remember
3	Explain in detail: a) Beam to column connection (7 marks) b) Doors and windows to wall connection(6 marks)	BT-3	Apply
4	List out i) The types of joints (7 marks) ii) Materials for concrete joints (6 marks)	BT-1	Remember
5	Summarize the essential requirements of joints in construction? What are the Recommendations for the design of an expansion joint?	BT-2	Understand
6	Explain expansion and contraction joint in retaining wall	BT-2	Understand
7	Discuss in detail about how joints are being dimensional in precast structures.	BT-3	Apply
8	Explain the various types of beam column connection	BT-4	Analyze
9	Illustrate in detail the different structural connection adopted in a framed precast building With sketches.	BT-4	Analyze
10	Explain the Do's and Don'ts 's for i. Detailing (4marks) ii.Beams and slabs (5 marks) iii.Columns (4marks)	BT-4	Analyze
11	What is the importance of joints in precast structures when compared to cast in situ structures?	BT-2	Understand
12	Compare the merits and demerits of expansion joints in prefabricated structures.	BT-2	Understand
13	Evaluate the joint Techniques and materials used in details and explain the design of joints.	BT-2	Understand
14	i) State the essential requirement of ideal structural joint ii) Discuss the salient points to be considered while designing a joint in the prefabricated construction process.	BT-2	Understand
14	Write a detailed note on Dimensioning and Detailing.	BT-4	Analyze
16	Write a brief note on monolithic construction.	BT-4	Analyze
17	Explain about column to column connection & beam to beam connection.	BT-2	Understand

PART - C

1	i) List out the general recommendations for the design of an expansion joint ii) List the advantages and applications of an expansion joint	BT-5	Evaluate
2	Illustrate briefly the ductility of joint and give the recommendations to design a ductile joint in precast structures.	BT-2	Understand
3	Explain the joints for different Structural Connections	BT-2	Understand
4	Discuss in detail about the column to foundation connection with a clear sketch.	BT-5	Evaluate
5	Write the importance of joints in precast structures and compare with cast-in-situ structures	BT-4	Analyze

UNIT V - DESIGN FOR ABNORMAL LOADS

Progressive collapse – Codal provisions – Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., - Importance of avoidance of progressive collapse.

PART A

1	Define Degree of Progressivity	BT-1	Remember
2	What are provisions made in a Prefabricated R C floors	BT-1	Remember
3	List any three possible causes of abnormal loads acting on the prefabricated buildings.	BT-1	Remember
4	Give the formula for design temperature change.	BT-1	Remember
5	What are the different types of seismic waves?	BT-1	Remember
6	Define earthen walls.	BT-1	Remember
7	What is strong column weak beam concept?	BT-2	Understand
8	What is meant by abnormal loads?	BT-2	Understand
9	What is damping?	BT-2	Understand
10	Define equivalent design loads for prefabricated Structures	BT-2	Understand
11	What are the special requirements for building in High Seismic region?	BT-1	Remember
12	What are the methods generally used to avoid the disproportion collapse in a building.	BT-3	Apply
13	Illustrate the methods of avoiding disproportionate collapse.	BT-3	Apply
14	Differentiate between intensity and magnitude of earthquake.	BT-1	Remember
15	How are cyclones formed?	BT-1	Remember
16	What is meant by equivalent design loads	BT-2	Understand
17	Generalize the approaches to avoid progressive collapse.	BT-1	Remember
18	Evaluate the codal provisions for the design of prefabricated structures.	BT-1	Remember
19	Define progressive collapse.	BT-2	Understand
20	Expand the importance factor and response reduction factor used in static analysis for the calculation of design seismic force.	BT-2	Understand
21	List the codes and standards for progressive collapse.	BT-1	Remember
22	How to increase the resistance to progressive collapse?	BT-3	Apply
23	What are the provisions made in prefabricated RC floors in a cyclone prone zone?	BT-1	Remember
24	What are the types of collapse in progressive structural elements?	BT-1	Remember
25	List the types of dampers.	BT-2	Understand

PART -B

1	Mention in detail the codal provision for considering the effect of earthquake?	BT-2	Understand
2	What are the methods to avoid the progressive collapse? Explain each briefly?	BT-2	Understand

3	Write a detailed note on preventing connection device for building structures.	BT-5	Evaluate
4	Mention in detail the codal provision for considering the effect of cyclones.	BT-2	Understand
5	Explain the situation for the occurrence of progressive collapse? and How do you avoid progression collapse.	BT-2	Understand
6	Explain the equivalent design loads for considering abnormal effects.	BT-2	Understand
7	Discuss the following : (i)Surface which is formed by the pattern or texture of the mould (6 marks) (ii)Paints and coatings (7 marks)	BT-2	Understand
8	How are explosive loads different from loads typically used in building design?	BT-3	Apply
9	Explain the codal provisions for progressive collapse	BT-4	Analyze
10	Explain Strong column and weak beam?	BT-4	Analyze
11	Compare between exterior frames & interior frames.	BT-4	Analyze
12	When a progressive collapse does occur? Why is it very critical to avoid progressive collapse of structures?	BT-5	Evaluate
13	Explain the following : (i)Surface finish produced by mechanical treatment(7 marks) (ii)Chemical treatment of the surface (6 marks)	BT-5	Evaluate
14	Explain the procedure for calculating equivalent design loads when the structure is subjected to earthquake loading.	BT-2	Understand
15	Compare between IS code and Europe code provisions for Abnormal effects.	BT-2	Understand
16	Enumerate the details of the Importance Avoidance of progressive collapse.	BT-2	Understand
17	What do you mean by abnormal loads? Explain the effects	BT-2	Understand

PART – C

1	Explain with a case study Equivalent design loads for abnormal effects such as cyclones.	BT-4	Analyze
2	Summarize about the different types of progressive collapses which occurs in the multi storey building with neat sketches.	BT-5	Evaluate
3	Explain the progressive collapse with a case study.	BT-3	Apply
4	Elaborate with a case study Equivalent design loads for abnormal effects such as earthquake loading.	BT-3	Apply
5	Explain the procedure for calculating equivalent design load when subjected to earthquake loading based on Indian codal provisions.	BT-4	Analyze