

# VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

## DEPARTMENT OF CIVIL ENGINEERING

### QUESTION BANK



### VIII SEMESTER

### CE6016 PREFABRICATED STRUCTURES

Regulation – 2013

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**SUBJECT : CE6016 PREFABRICATED STRUCTURES**

**SEM / YEAR: VIII/IV**

### UNIT 1 – INTRODUCTION

Need for prefabrication –Principles –Materials -Modular coordination –Standardization –  
Systems –Production -Transportation –Erection.

#### PART – A

1.	Define Prefabrication.	BT1	Remembering
2.	What is meant by Modular Co-ordination?	BT1	Remembering
3.	Give the Different types of Modular Grids	BT1	Remembering
4.	List out the limitations of modular coordination in Precast Elements.	BT1	Remembering
5.	List out the System of Prefabrication.	BT1	Remembering
6.	List out the advantages and disadvantages of prefabricated system	BT1	Remembering
7.	Discuss about Production process.	BT2	Understanding
8.	Describe the stand system Production technique.	BT2	Understanding
9.	Distinguish between site prefabrication and plant prefabrication	BT2	Understanding
10.	Summarize the erection procedure PFS building	BT2	Understanding
11.	Classify the methods for Manufacture of precast concrete elements (or) the types of prefabrication	BT3	Applying
12.	Demonstrate the Insulating concrete forms	BT3	Applying
13.	Illustrate the term lift slab construction.	BT3	Applying
14.	Explain the aggregate system production technique.	BT4	Analysing
15.	Explain the conveyor belt or production line system Production technique.	BT4	Analysing
16.	State the Principles of MC Concept?	BT4	Analysing
17.	Design the criteria in selection of the lifting points if the surface should be free of discernible cracks?	BT5	Evaluating
18.	Generalize the factors which affect the loading conditions in demoulding and transport of components?	BT5	Evaluating
19.	Explain the term lift slab construction	BT6	Creating
20.	Explain the characteristics of materials used for construction of PFS?	BT6	Creating

#### PART B

1.	What are the different types of Structural Systems used in Prefabricated Structures? Explain	BT1	Remembering
2.	What are Erection Stresses? How they are Reduced or	BT1	Remembering

	Eliminated?		
3.	Describe in detail about the Different Materials used the Principle and need of Prefabrication.	BT1	Remembering
4.	Explain the Erection Principles of Precast Members with suitable sketches	BT2	Understanding
5.	Discuss in detail about the principle of prefabrication techniques and Mention its advantages and disadvantages.	BT2	Understanding
6.	i) Discuss the concept of Production Techniques. (8marks) ii) What are the types and needs of Prefabricates? (8marks)	BT4	Analyzing
7.	Illustrate the important aspect considered during hoisting, erection and transportation of precast element.	BT3	Applying
8.	Explain in detail about the concept of modular coordination and State its significance in prefabricated structures.	BT4	Analyzing
9.	i) Enumerate the process of product of prefabrication(4 marks) ii) Write short note on a) Prefabrication. (3 marks) b) Standardization (3 marks) c) Advantages and disadvantages (3 marks) d) Erection process (3 marks)	BT6	Creating
10.	Summarize the Transporting and hoisting of Prefabrication.	BT2	Understanding
11.	Explain the merits and demerits of prefabrication systems.	BT4	Analyzing
12.	Explain the two types of prefabrication systems in detail.	BT2	Understanding
13.	i) Enumerate the need of prefabrication.(8 marks) ii) Explain the principle of prefabrication.(8 marks)	BT2	Understanding
14.	Discuss the process of production, transportation and erection of prefabrication	BT4	Analyzing

## UNIT II - PREFABRICATED COMPONENTS

Behaviour of structural components –Large panel constructions –Construction of roof and floor slabs –Wall panels –Columns –Shear walls

### PART A

1.	Define Shear wall.	BT1	Remembering
2.	What are the loads acting on wall panel members?	BT1	Remembering
3.	Define Long Wall System	BT1	Remembering
4.	How are precast floors classified?	BT1	Remembering
5.	List out the prefabricated structural units.	BT1	Remembering
6.	What are the space bordering?	BT1	Remembering
7.	Differentiate between synclastic and Anticlastic?	BT2	Understanding
8.	Write about Prefabricated Roofing and flooring elements	BT2	Understanding
9.	Discuss about dome structure	BT2	Understanding
10.	Explain about box type construction.	BT2	Understanding
11.	Classify the precast concrete walls	BT3	Applying
12.	Give classification of wall panels	BT3	Applying
13.	How are roofing members in prefabricates classified?	BT3	Applying
14.	Different classification of shear walls?	BT4	Analyzing
15.	Mention the types of prefabricated structural elements	BT4	Analyzing
16.	Explain the surface forming members.	BT4	Analyzing
17.	Enumerate the classification of floor slabs.	BT5	Evaluating

18.	Prepare the necessity of dimensional tolerances.	BT5	Evaluating
19.	Discuss about the ring system.	BT6	Creating
20.	List out the recommended lateral load resisting elements in a building	BT6	Creating

### PART - B

1.	Explain the methods of construction of roof and floor slab. Also explain the precautions taken during the manufacturing process.	BT1	Remembering
2.	What is meant by prefabricated components? Explain in detail.	BT1	Remembering
3.	Describe in detail about large panel construction with neat sketches.	BT1	Remembering
4.	Differentiate the behavior of frame and large panel construction in precast structures.	BT2	Understanding
5.	i) Describe the manufacturing Process of wall panels (8marks) ii) With the Flow chart explain the manufacturing process of roof and floor slabs (8marks)	BT2	Understanding
6.	Classify the structure of building based on the load distribution and briefly explain the different types of such prefabricated building.	BT3	Applying
7.	Compare the column Structures with Shell structures	BT4	Analyzing
8.	i) What is the necessity of providing shear walls in the precast structures? (8marks) ii) Discuss the different types of shear walls.(8marks)	BT4	Analyzing
9.	Discuss about behavior of columns in prefabricated structures.	BT5	Evaluating
10.	Explain about the warped surface and Domes in detail.	BT6	Creating
11.	Explain the process involved in prefabrication of columns	BT2	Understanding
12.	Compare the behavior of conventional and prefabricated structural components.	BT4	Analyzing
13.	Explain the behavior of roof and floor slab construction with suitable sketches.	BT6	Creating
14.	i) Write briefly about types of wall panels.(8marks) ii) Write a brief notes on Column structures.(8marks)	BT1	Remembering

### UNIT - III DESIGN PRINCIPLES

Disuniting of structures-Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.

### PART A

1.	Define disuniting of structures.	BT1	Remembering
2.	What are the Loads acting in wall panels?	BT1	Remembering
3.	How the material used in construction does affect the design of the element?	BT1	Remembering
4.	What is joint flexibility?	BT1	Remembering
5.	What are the disadvantages of disuniting of structures?	BT1	Remembering
6.	Define expansion joints	BT1	Remembering
7.	What are the advantages of disuniting of structures?	BT2	Understanding
8.	Explain joint deformation?	BT2	Understanding
9.	At what point in the members disuniting should be done?	BT2	Understanding
10.	Explain the dimensional tolerances	BT2	Understanding
11.	Write the need for disuniting of structures.	BT3	Applying

12.	Classify the Types of walls	BT3	Applying
13.	Why should we give allowance for joint deformation?	BT3	Applying
14.	Distinguish between Concrete wall and Shear Wall.	BT4	Analyzing
15.	Explain expansion joint and flexibility joint.	BT4	Analyzing
16.	Analyze the problems in design because of joint flexibility.	BT4	Analyzing
17.	Generalize the assumptions which made for concrete Walls.	BT5	Evaluating
18.	Compose the different types of tolerances adopted in precast	BT5	Evaluating
19.	Explain briefly about the suitable design of cross section based on efficiency.	BT6	Creating
20.	Conclude the process of disuniting of prefabricated structures.	BT6	Creating

### PART B

1.	What is joint flexibility and allowance for joint deformation? Explain problems in design	BT1	Remembering
2.	Explain the problems in design because of joint flexibility. Discuss with regard to various location.	BT1	Remembering
3.	What are the precautions taken during the disuniting the Structures?	BT1	Remembering
4.	Discuss the necessity of disuniting of structures and explain in detail with sketch	BT2	Understanding
5.	Explain in detail about the suitable design of cross section based on efficiency.	BT2	Understanding
6.	Design a concrete wall panel of 8m height & 5m long & 200mm thick & restrained against rotation at the base & restrained @ the ends. If it is to carry a load of 180KN @ the top. Another factored load horizontal to the wall is 8.45KN @ the top. Check the safety of the wall. $f_{ck}=20, f_y=415$ . Check the shear in the wall if the	BT3	Applying
7.	Enumerate the salient points considered while designing a joint and also discuss the importance of joint flexibility	BT4	Analyzing
8.	Design procedure for corbels, Concrete walls & its assumptions.	BT3	Applying
9.	Explain how the material selection impacts the design efficiency of a precast element.	BT5	Evaluating
10.	Generalize the steps involved in the process of disuniting of prefabricated structures.	BT6	Creating
11.	Is a Prestressed structure efficient in reducing the demand of material and cost? If so-explain.	BT4	Analyzing
12.	Describe why structural analysis is to be done for precast structures.	BT2	Understanding
13.	List out the i) key processes and (4 marks) ii) Roles in precast construction and explain. (12 marks)	BT1	Remembering
14.	Analyse how the structures are being grouped and how the prefabricated members are joined.	BT4	Analyzing

## UNIT – IV JOINTS IN STRUCTURAL MEMBERS

Joints for different structural connections –Dimensions and detailing –Design of expansion joints

### PART - A

1.	Discuss the importance of joints in precast structures when compared to cast- in-situ structures?	BT2	Understanding
2.	What is the need for expansion joint in precast structures?	BT4	Analyzing
3.	What are the connections?	BT2	Understanding
4.	List the different types of connections?	BT1	Remembering
5.	Evaluate the points to be considered while designing the connections?	BT5	Evaluating
6.	Show the different connections made in a prefabricated structure	BT3	Applying
7.	What are the different types of joints?	BT1	Remembering
8.	What are the materials used for concrete joints?	BT1	Remembering
9.	Based on the location within a building, how connections can be classified?	BT4	Analyzing
10.	What are the functions of joints?	BT2	Understanding
11.	Outline the use of expansion joints.	BT2	Understanding
12.	Give any two types of joints in prefabricated structures.	BT1	Remembering
13.	Generalize the significance of connections in precast structures?	BT5	Evaluating
14.	Explain expansion joint	BT6	Creating
15.	Draw a joint connecting wall panel with a frame	BT6	Creating
16.	Write any 2 characteristics of expansion joint.	BT1	Remembering
17.	Explain post tensioned connection.	BT4	Analyzing
18.	Give any 4 types of joints.	BT1	Remembering
19.	What is the significance of connections in precast construction?	BT3	Applying
20.	Give the formula for design temperature change	BT3	Applying

### PART - B

1.	Explain expansion and contraction joint in retaining wall	BT2	Understanding
2.	Summarize the essential requirements of joints in construction? What are the Recommendations for the design of an expansion joint?	BT2	Understanding
3.	Give the recommendations for the detailing the precast settlement in respect of the Connections and erection.	BT1	Remembering
4.	Compare the merits and demerits of expansion joints in prefabricated structures.	BT4	Analyzing
5.	Explain any two types of beam column joints in prefabricated structures with neat sketches.	BT6	Creating
6.	Illustrate in detail the different structural connection adopted in a framed precast building With sketches.	BT3	Applying
7.	What is the importance of joints in precast structures when compared to cast in situ structures?	BT4	Analyzing
8.	What is the requirement of ideal structural joints? Explain different joint of structures.	BT1	Remembering
9.	Evaluate the joint Techniques and materials used in details and explain the design of joints.	BT5	Evaluating
10.	Explain in detail: a) Beam to column connection (8marks)	BT1	Remembering

	b) Doors and windows to wall convection(8marks)		
11.	Discuss in detail about how joints are being dimensional in precast structures.	BT2	Understanding
12.	Explain the Do's and Don'ts for i. Detailing (4marks) ii. Beams and slabs(4marks) iii. Columns(4marks) iv. General(4marks)	BT4	Analyzing
13.	Illustrate in detail about the following connection, its uses and where it can be used i) Column to column(8marks) ii) Main beam to secondary beam(8marks)	BT3	Applying
14.	List out i) The types of joints (8 marks) ii) materials for concrete joints (8 marks)	BT1	Remembering

### UNIT V - DESIGN FOR ABNORMAL LOADS

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

#### PART - A

1.	Explain progressive collapse	BT6	Creating
2.	Define Degree of Progressivity	BT1	Remembering
3.	Generalize the approaches to avoid progressive collapse	BT5	Evaluating
4.	What are the special requirements for building in High Seismic	BT3	Applying
5.	What are provisions made in a Prefabricated R C floors in a	BT1	Remembering
6.	What is strong column weak beam concept?	BT2	Understanding
7.	List the possible abnormal effects for prefabricated buildings.	BT1	Remembering
8.	Give the formula for design temperature change.	BT1	Remembering
9.	How are cyclones formed?	BT4	Analyzing
10.	What are the different types of seismic waves?	BT1	Remembering
11.	Explain equivalent design loads.	BT4	Analyzing
12.	Explain the importance factor and response reduction factor used in static analysis for the calculation of design seismic force.	BT6	Creating
13.	What is meant by progressive collapse?	BT2	Understanding
14.	Differentiate between intensity and progressive earthquake.	BT4	Analyzing
15.	What is damping?	BT2	Understanding
16.	Explain equivalent design loads.	BT2	Understanding
17.	Illustrate the IS code provision for abnormal effects?	BT3	Applying
18.	Define earthen walls.	BT1	Remembering
19.	Illustrate the methods of avoiding disproportionate collapse.	BT3	Applying
20.	Evaluate the codal provisions for the design of prefabricated structures.	BT5	Evaluating

#### PART - B

1.	Mention in detail the codal provision for considering the effect of earthquake?	BT1	Remembering
2.	When a progressive collapse does occur? Why is it very critical to avoid progressive collapse of structures?	BT5	Evaluating
3.	Explain the procedure for calculating equivalent design	BT6	Creating

	loads when the structure is subjected to earthquake loading		
4.	What are the methods to avoid the progressive collapse? Explain each briefly?	BT1	Remembering
5.	How are explosive loads different from loads typically used in building design?	BT3	Applying
6.	Explain the equivalent design loads for considering abnormal effects.	BT2	Understanding
7.	(i) Explain the codal provisions for progressive collapse (8 marks) (ii) Enumerate the details of the Importance Avoidance of progressive collapse. (8 marks)	BT3	Applying
8.	Compare between exterior frames & interior frames.	BT4	Analyzing
9.	Write a detailed note on preventing connection device for building structures.	BT1	Remembering
10.	(i) Explain the situation for the occurrence of progressive collapse? (8 marks) (ii) How do you avoid progression collapse? (8 marks)	BT2	Understanding
11.	Explain Strong column and weak beam?	BT3	Applying
12.	Discuss the following : (i) Surface which is formed by the pattern or texture of the mould (8 marks) (ii) Paints and coatings (8 marks)	BT2	Understanding
13.	Explain the following : (i) Surface finish produced by mechanical treatment (8 marks) (ii) Chemical treatment of the surface (8 marks)	BT6	Creating
14.	Mention in detail the codal provision for considering the effect of cyclones.	BT1	Remembering



## BT-ALLOTMENT

S.no	Subject		BT1	BT2	BT3	BT4	BT5	BT6	Total Question
1	Unit-1	Part-A	6	4	3	3	2	2	20
		Part-B	3	4	1	4	1	1	14
2	Unit-2	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	1	3	1	2	14
3	Unit-3	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
4	Unit-4	Part-A	6	4	3	3	2	2	20
		Part-B	4	4	2	3	1	1	14
5	Unit-5	Part-A	5	3	3	3	2	2	20
		Part-B	4	3	3	1	1	2	14

### TOTAL NO. OF QUESTIONS IN EACH PART

PART-A	100
PART-B	70
TOTAL	170

