

**SRM VALLIAMMAI ENGINEERING COLLEGE**

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

**DEPARTMENT OF CIVIL ENGINEERING**

**QUESTION BANK**



**IV SEMESTER**

**CE3463 - CONSTRUCTION TECHNIQUES AND EQUIPMENTS**

**Regulation – 2023**

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*Prepared by*

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**SUBJECT CODE/NAME:** CE3463 - CONSTRUCTION TECHNIQUES AND EQUIPMENTS  
**SEM/YEAR:** IV/II

<b>UNIT I CONSTRUCTION TECHNIQUES</b>			
Structural systems - Load Bearing Structure - Framed Structure - Load transfer mechanism – floor system - Development of construction techniques - High rise Building Technology - Seismic effect - Environmental impact of materials – responsible sourcing - Eco Building (Green Building) - Material used - Construction methods - Natural Buildings - Passive buildings - Intelligent (Smart) buildings - Meaning - Building automation - Energy efficient buildings for various zones-Case studies of residential, office buildings and other buildings in each zones.			
<b>PART A</b>			
Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	How can a structural system be defined?	BT-1	Remembering
2.	How are buildings classified based on their structural systems?	BT-1	Remembering
3.	Distinguish load bearing structure & framed structure.	BT-1	Remembering
4.	Sketch the pattern of load transfer mechanism.	BT-1	Remembering
5.	Outline floor system.	BT-1	Remembering
6.	Demonstrate the development of construction techniques.	BT-1	Remembering
7.	Compare the features implemented on high rise building technology.	BT-2	Understanding
8.	What is seismic effect?	BT-2	Understanding
9.	Prioritize the environmental impact of construction materials.	BT-2	Understanding
10.	Summarize the features of Eco building.	BT-2	Understanding
11.	List out any four construction materials used for constructing an eco-building.	BT-3	Applying
12.	Compose the characteristic features of construction materials.	BT-1	Remembering
13.	Give the limitations of natural buildings.	BT-1	Remembering
14.	Investigate intelligent buildings.	BT-1	Remembering
15.	What is an energy efficient building?	BT-2	Understanding
16.	Outline the major sources to be considered to make the building energy efficient.	BT-3	Applying
17.	Demonstrate about passive buildings.	BT-3	Applying
18.	List out the recent smart materials used in building construction.	BT-3	Applying
19.	List out the preventive measures that can be adopted for seismic effect.	BT-1	Remembering
20.	What are the 4 types of structural systems?	BT-1	Remembering
21.	What equipment is used in high-rise building construction?	BT-1	Remembering
22.	What is the latest building technology?	BT-1	Remembering

23.	How do building materials impact the environment?	BT-2	Understanding
24.	What is an example for building automation?	BT-1	Remembering
<b>PART B</b>			
1.	Describe the structural system and explain its various types in detail.	BT-3	Applying
2.	Discuss the characteristic features of load-bearing structures and framed structures in detail.	BT-3	Applying
3.	Explain the step-by-step load transfer mechanism in a structure, describing each stage in detail	BT-4	Analyzing
4.	Explain the key features of high-rise building technology.	BT-3	Applying
5.	Illustrate and explain the seismic effects on high-rise buildings in detail.	BT-3	Applying
6.	Explain the limitations, benefits, and requirements of intelligent buildings in detail	BT-3	Applying
7.	Justify the statement: 'An eco-building is an energy-efficient building,' with suitable explanations	BT-4	Analyzing
8.	(i) Explain the following in detail: (i) Comparison of materials used in green buildings. (8) (ii) Recycling methods adopted in eco-buildings. (8)	BT-4	Analyzing
9.	Explain the various construction methods with suitable details.	BT-3	Applying
10.	Differentiate between natural buildings and passive buildings.	BT-4	Analyzing
11.	Summarize the major characteristics of the different climatic zones of India	BT-3	Applying
12.	Explain the concept and components of Building Automation Systems.	BT-3	Applying
13.	Explain in detail about smart buildings	BT 3	Applying
14.	Justify the statement: 'Framed structures perform better than load-bearing structures.'	BT-4	Analyzing
15.	Discuss the limitations of modern construction techniques in elaborately.	BT-4	Analyzing
16.	Elaborate on the role of materials and construction methods in achieving green building concepts	BT-3	Applying
17.	Explain modern methods of construction with suitable examples.	BT-3	Applying
<b>UNIT II CONSTRUCTION SEQUENCES</b>			

Specifications, details and sequence of activities and construction co-ordination – Site Clearance – Marking – Earthwork - masonry – stone masonry – Bond in masonry - concrete hollow block masonry – flooring – damp proof courses – construction joints – movement and expansion joints – pre cast pavements – Building foundations – basements – temporary shed – centering and shuttering – slip forms – scaffoldings – de-shuttering forms – Fabrication and erection of steel trusses – frames – weather and water proof – roof finishes.

**PART-A**

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define specifications used in construction works.	BT 1	Remembering
2.	Define scaffolding in building construction.	BT 1	Remembering
3.	List the different types of masonry.	BT 1	Remembering
4.	Define ashlar masonry.	BT 1	Remembering
5.	What are the advantages of using English bond?	BT 1	Remembering
6.	Define slip-form construction.	BT 1	Remembering
7.	Explain the term marking as used in construction practice.	BT 2	Understanding
8.	Explain the steps involved in site clearance operations.	BT 2	Understanding
9.	Define dampness in buildings.	BT 2	Understanding
10.	List the sequence of activities involved in building construction.	BT 3	Applying
11.	Identify any three materials used for construction joints.	BT 3	Applying
12.	Illustrate the classification of stone masonry with examples.	BT 3	Applying
13.	Differentiate between English bond and Flemish bond.	BT 2	Understanding
14.	Explain the purpose and components of centering and shuttering.	BT 3	Applying
15.	Define scaffolding and list its different types.	BT 2	Understanding
16.	List the importance of providing damp proof course (DPC) in buildings.	BT 3	Applying
17.	Compare expansion joints and construction joints.	BT 3	Applying
18.	Describe the structural concept of braced domes.	BT 2	Understanding
19.	Discuss the functions of foundations in buildings.	BT 3	Applying
20.	Explain the procedure for brick laying in masonry work.	BT 2	Understanding
21.	Explain the process involved in laying foundations.	BT 3	Applying
22.	Differentiate between weatherproofing and waterproofing.	BT 2	Understanding
23.	Define site clearance in construction projects.	BT 2	Understanding
24.	Define fire protection in buildings.	BT 1	Remembering

**PART-B**

1.	Define masonry. Briefly explain the types of stone masonry with neat sketch.	BT 3	Applying
2.	Identify the different types of bonds used in brick masonry and explain each with neat sketches.	BT 3	Applying
3.	Explain the general principles to be observed while laying Damp Proof Course (DPC). Also discuss the materials used for DPC and their properties.	BT 3	Applying
4.	Explain the fire protection requirements of buildings with reference to safety regulations.	BT 4	Analyzing
5.	Define scaffolding and explain its components. Classify the different types of scaffolding and explain any two types with neat sketches.	BT 3	Applying

6.	Plan and explain the sequence of construction activities and discuss the importance of construction coordination in building projects.	BT 4	Analyzing
7.	Explain various types of roof finishes used in buildings and elaborate their construction methods, advantages, and applications.	BT 4	Analyzing
8.	Classify the types of flooring used in buildings and explain any five types in detail with neat sketches.	BT 3	Applying
9.	Explain the sequence of construction activities in a building project with the help of neat sketches.	BT 3	Applying
10.	Explain the formwork used for staircases with neat sketches and discuss its requirements and precautions.	BT 3	Applying
11.	Explain the following construction practices: i. Pre cast pavements (6) ii. Temporary shed (5) iii. Centering and shuttering (5)	BT 4	Analyzing
12.	Explain English bond and Flemish bond in brick masonry with neat sketches and suitable applications.	BT 3	Applying
13.	Explain the various types of shuttering used in construction and discuss their advantages and limitations.	BT 4	Analyzing
14.	Examine building foundations in detail, including their functions, types, and suitability for different soil conditions.	BT 5	Evaluating
15.	Categorize and explain the fabrication and erection process of steel frames used in building construction.	BT 4	Analyzing
16.	Assess the process of shuttering and de-shuttering of formwork, highlighting the precautions and quality control measures.	BT 5	Evaluating
17.	Explain the construction methodology of an RCC cooling tower using slip-form techniques with neat sketches.	BT 4	Analyzing

### UNIT III CONSTRUCTION OF SUB STRUCTURES

Techniques of Box jacking – Pipe Jacking -under water construction of diaphragm walls and basement-Tunneling techniques – Piling techniques - well and caisson - sinking cofferdam cable anchoring and grouting - driving diaphragm walls, sheet piles - shoring for deep cutting well points -Dewatering and stand by Plant equipment for underground open excavation.

#### PART A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define the box jacking technique used in underground construction.	BT 1	Remembering
2.	Define the pipe jacking technique and explain its basic concept.	BT 1	Remembering
3.	List the major applications of the pipe jacking method.	BT 1	Remembering
4.	Explain the concept of under-reamed piles and discuss their construction and applications.	BT 1	Remembering
5.	Explain well foundations, including their components and uses.	BT 1	Remembering
6.	Define grouting and explain its purpose in civil engineering works.	BT 1	Remembering
7.	Explain the essential features of pumps used for dewatering	BT 2	Understanding

	operations.		
8.	Explain the various methods adopted for tunnel driving with suitable illustrations.	BT 2	Understanding
9.	Explain the uses and applications of sheet piles in construction projects.	BT 2	Understanding
10.	Classify the different methods used for dewatering deep excavations	BT 2	Understanding
11.	Explain the advantages of the drift method used in tunneling operations.	BT 3	Applying
12.	List the different types of cofferdams used in construction works.	BT 3	Applying
13.	Define tunneling as used in civil engineering works.	BT 2	Applying
14.	List the advantages of box jacking and pipe jacking techniques.	BT 1	Remembering
15.	List any four types of piling techniques used in foundation engineering.	BT 3	Applying
16.	List the various methods of tunneling adopted in soft soil conditions.	BT 3	Applying
17.	Explain the situations in which caisson foundations are adopted.	BT 3	Applying
18.	Explain the construction procedure of diaphragm walls built under water.	BT 1	Remembering
19.	Explain the concept and applications of cable anchoring in construction works.	BT 3	Applying
20.	Define the dewatering process and explain its purpose in construction projects.	BT 1	Remembering
21.	Explain the benefits and applications of diaphragm walls in deep excavations.	BT 2	Understanding
22.	Define cofferdam and classify its different types.	BT 2	Understanding
23.	Explain the construction method of diaphragm walls with suitable details.	BT 2	Understanding
24.	Define the well point method used for dewatering excavations.	BT 2	Understanding
<b>PART-B</b>			
1.	Describe in detail the procedure involved in the underwater construction of diaphragm walls and basements, with suitable sketches.	BT 4	Analyzing
2.	Define cofferdam and explain the different types of cofferdams with neat sketches and applications.	BT 4	Analyzing
3.	Explain tunnel construction and discuss the various tunneling techniques used in civil engineering projects.	BT 3	Applying
4.	Explain pneumatic caissons in detail. Discuss their construction procedure and conditions under which they are adopted.	BT 4	Analyzing
5.	Explain the dewatering technique in construction. Describe in detail the various dewatering methods used in deep excavations.	BT 3	Applying
6.	Describe the sequence of operations involved in pipe jacking for underwater bridge construction with suitable sketches.	BT 4	Analyzing
7.	Describe the different methods adopted for the construction of diaphragm walls, explaining each method in detail.	BT 4	Analyzing

8.	Explain the method of pile driving with neat sketches and discuss the equipment used.	BT 3	Applying
9.	Explain the box jacking technique in detail, including its procedure, advantages, and applications.	BT 5	Evaluating
10.	Elaborate on sinking cofferdams. Explain their construction procedure, advantages, and applications with neat sketches	BT 4	Analyzing
11.	Explain the well-pointing system and describe how dewatering is carried out using this method.	BT 3	Applying
12.	Explain the well-point system with neat sketches and discuss its suitability in construction projects.	BT 4	Analyzing
13.	Describe the various methods of underwater concreting operations, explaining their procedures and applications.	BT 4	Analyzing
14.	Explain in detail the equipment used for driving wells and caissons, sinking cofferdams, and shoring in deep excavations.	BT 3	Applying
15.	Explain sheet piles with neat sketches, including their types, installation methods, and applications.	BT 4	Analyzing
16.	Explain the following construction techniques in detail: (i) Grouting (8) (ii) Cable anchoring (8)	BT 3	Applying
17.	Define shoring and describe the various types of shores used in construction with suitable sketches.	BT 4	Analyzing

#### UNIT IV CONSTRUCTION OF SUPER STRUCTURES

Launching girders, bridge decks, off shore platforms – special forms for shells - techniques for heavy decks – in-situ pre-stressing in high rise structures, Material handling - erecting light weight components on tall structures - Support structure for heavy Equipment and conveyors Erection of articulated structures, braced domes and space decks.

#### **PART – A**

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define bridge decks and explain their functions, types, and construction considerations.	BT 1	Remembering
2.	Define the term support structure and explain its role in civil engineering works.	BT 1	Remembering
3.	Explain launching girders, their purpose, and applications in bridge construction.	BT 1	Remembering
4.	Define offshore platforms and classify their types with suitable examples.	BT 1	Remembering

5.	Define articulated structures and explain their advantages and applications.	BT 1	Remembering
6.	Explain the purpose and design considerations of transmission towers.	BT 1	Remembering
7.	Summarize the key advantages of using articulated structures in construction.	BT 2	Understanding
8.	Explain the uses of silos in storage and industrial applications, including design considerations.	BT 2	Understanding
9.	Illustrate the major techniques adopted for constructing heavy decks in bridges or buildings.	BT 2	Understanding
10.	Summarize the precautions to be taken while erecting lightweight components on tall structures.	BT 2	Understanding
11.	Draw a neat sketch of formwork for shell structures and explain its components.	BT 3	Applying
12.	Explain the situations in which articulated structures can be adopted and justify their use.	BT 3	Applying
13.	Classify the types of offshore platforms and explain the structural differences.	BT 3	Applying
14.	List the reasons for using special forms for shell structures and explain their importance.	BT 2	Understanding
15.	Define cable-stayed bridges and explain their design, advantages, and applications.	BT 3	Applying
16.	Explain skyscrapers, including their structural systems, construction methods, and key considerations.	BT 2	Understanding
17.	Explain the various operations involved in the construction of offshore platforms with suitable illustrations.	BT 3	Applying
18.	Evaluate the reasons for using special forms for shell structures in terms of structural and construction advantages.	BT 3	Applying
19.	Compile the different methods of prestressing used in concrete structures and explain their applications.	BT 3	Applying
20.	List and explain the purposes of plastering in building construction.	BT 2	Understanding
21.	Explain the purpose of providing damp proof courses (DPC) in buildings and discuss their importance.	BT 3	Applying
22.	Define lateral load and explain its effects on building structures.	BT 2	Understanding
23.	List the types of non-bearing walls and explain the construction and function of any one type with examples.	BT 2	Understanding
24.	Explain reinforced cement concrete (RCC) beams, including their components, types, and applications in buildings.	BT 1	Remembering
<b>PART – B</b>			
1.	Explain the construction techniques for bridge decks with the help of a flowchart. Include types of decks and construction sequence.	BT 4	Analyzing

2.	Explain the erection of articulated towers using a flow diagram. Discuss key steps and safety considerations.	BT 3	Applying
3.	Describe the construction of a typical belt conveyor installation and explain the advantages of using belt conveyors for material transport.	BT 3	Applying
4.	Explain the general requirements for launching girders in bridge construction, including equipment, safety, and procedural considerations.	BT 4	Analyzing
5.	Explain in detail the construction of special forms of shells, including methods, materials, and structural considerations.	BT 3	Applying
6.	Write detailed notes on Bow-string bridges and cable-stayed bridges, including design, structural features, and applications.	BT 3	Applying
7.	Describe the procedure involved in the erection of braced domes and space decks with suitable sketches.	BT 4	Analyzing
8.	Explain the various types of domes used in construction with neat sketches, highlighting their structural advantages.	BT 4	Analyzing
9.	Demonstrate the procedure for erecting lightweight structures on tall buildings, including safety and material handling considerations.	BT 4	Analyzing
10.	Compare the merits and demerits of various types of shell structures, including construction methods and applications.	BT 3	Applying
11.	Define sheet piles, list the factors to be considered for their selection, and explain their types based on material.	BT 3	Applying
12.	Explain the support structures required for heavy equipment and conveyors, including design and safety considerations.	BT 3	Applying
13.	Explain about: (i) Skyscrapers and Transmission towers. (8) (ii) Material handling systems (8)	BT 4	Analyzing
14.	Write detailed notes on bridge decks, including types, construction methods, and load considerations.	BT 5	Evaluating
15.	Write detailed notes on roof shell structures, including types, construction techniques, and structural advantages.	BT 3	Applying
16.	Explain in detail about offshore platforms, including types, construction methods, and operational requirements.	BT 4	Analyzing
17.	Explain the construction sequence of a skyscraper in detail, highlighting planning, foundation, structural system, and safety considerations.	BT-5	Evaluate

## UNIT V CONSTRUCTION EQUIPMENT

Selection of equipment for earth work - earth moving operations - types of earthwork equipment - tractors, motor graders, scrapers, front end loaders, earth movers – Equipment for foundation and pile driving. Equipment for compaction, batching, mixing and concreting - Equipment for material handling and erection of structures – types of cranes - Equipment for dredging, trenching, tunneling,

### PART – A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Define scrapers.	BT 1	Remembering
2.	Write the formula or method to calculate the output of a scraper.	BT 1	Remembering
3.	List the factors influencing the selection of construction equipment.	BT 1	Remembering
4.	List various types of vibrators used in concrete compaction.	BT 1	Remembering
5.	Define dredging.	BT 1	Remembering
6.	List the equipment needed for compacting concrete.	BT 1	Remembering
7.	What is a TBM (Tunnel Boring Machine)?	BT 2	Understanding
8.	List the types of manual handling equipment used in construction.	BT 2	Understanding
9.	List the types of earthwork equipment.	BT 2	Understanding
10.	Name the operations performed by a motor grader.	BT 2	Understanding
11.	State the need for equipment management at a construction site.	BT 2	Understanding
12.	List the types of conveyors used in construction.	BT 2	Understanding
13.	Classify the different methods of tunneling.	BT 2	Understanding
14.	Mention the operations performed by a motor grader.	BT 2	Understanding
15.	List the various operations involved in using graders.	BT 2	Understanding
16.	Point out the factors influencing soil or concrete compaction.	BT 2	Understanding
17.	Name the equipment used for volume batching in concrete production.	BT 2	Understanding
18.	Name the equipment used for earthmoving operations.	BT 1	Remembering
19.	List the sequence of operations for driving a tunnel through rock.	BT 2	Understanding
20.	Write about pile driving equipment.	BT 1	Remembering
21.	List any two reasons for dredging.	BT 2	Understanding
22.	How many types of cranes are there?	BT 2	Understanding
23.	Define concrete batching equipment.	BT 2	Understanding
24.	Name the equipment used for batching and mixing concrete.	BT 2	Understanding

### PART – B

1.	List and explain the different dredging techniques used in construction and civil engineering projects. Illustrate each method with neat sketches and highlight their applications.	BT 4	Analyzing
2.	Explain in detail the various equipment used for pile driving, including their working principles, types, and applications. Illustrate with sketches where necessary.	BT 4	Analyzing
3.	Explain the various operations involved in road construction, starting from site preparation to finishing, and discuss the sequence and	BT 3	Applying

	importance of each operation.		
4.	Examine the different types of earthwork equipment used in construction. Describe in detail any two earthmoving machines, explaining their working, components, and applications.	BT 4	Analyzing
5.	Discuss in detail the role of tractors in earthmoving operations. Include types of tractors, working principles, and applications with neat sketches.	BT 3	Applying
6.	With a neat sketch, explain a typical batching plant, describing its components, working, and applications in concrete production.	BT 4	Analyzing
7.	Explain the various operations performed by multipurpose excavators with neat sketches, including loading, digging, and material handling.	BT 4	Analyzing
8.	Distinguish between crawler-type and pneumatic wheel excavators, comparing their design, advantages, and applications.	BT 3	Applying
9.	Illustrate and explain the factors to be considered in the selection of equipment for earthwork projects, including soil type, project scale, and cost.	BT 5	Evaluating
10.	List and explain the different types of cranes. Describe any three cranes in detail with sketches, working principles, and applications.	BT 4	Analyzing
11.	Explain the different types of dredgers with neat sketches, including: (i) Dipper Dredger (5) (ii) Bucket Dredger (5) (iii) Wheel Dredger (6)	BT 3	Applying
12.	Analyze the equipment used for erection of structures in construction, explaining types, working, and safety considerations in detail.	BT 4	Analyzing
13.	Explain in detail the various aspects of graders and scrapers, including their functions, operation sequence, and applications in earthmoving.	BT 4	Analyzing
14.	Explain trenching in detail and describe the equipment used for trenching operations with sketches and working principles.	BT 3	Applying
15.	List the equipment used for concreting work and explain the purpose and working of each.	BT 4	Analyzing
16.	Discuss the advantages of elevating scrapers in earthmoving operations, including efficiency, cost, and safety considerations.	BT 3	Applying
17.	Explain in detail the various equipment used for compaction, batching, and mixing of concrete, including working principles, types, and applications.	BT 5	Evaluating