

**SUBJECT: BUILDING CONSTRUCTION & MAINTENANCE****CLASS XII  
SEMESTER - III****THEORY****FULL MARKS – 30****(MCQ Type Question)**

UNIT	Topic	No of periods assigned	Marks
1	Introduction	7	4
2	Construction Materials, Reinforcing Materials, Structural Steel Section, Admixture	18	13
3	Types, Function & Method of Construction of different Parts of a building.	20	13

**DETAIL SYLLABUS**

UNIT	Topic / Sub Topic	No of periods assigned	
		Topic / Sub Topic	Total
1	1. Introduction:		7
	1.1 History of Civil Construction Work	1	
	1.2 Building Construction.	2	
	1.3 Road Construction (NH, SH, District Road, Rail-Road),	2	
	1.4 Irrigation (Diversion head work) Classification of bricks.	2	
2	2. Materials of Construction		18
	2.1 Introduction to construction Materials, aggregates, Bricks, Lime, Mineral admixture, Cement, Sand, Clay Products, Mortar, Concrete.	9	
	2.2 Reinforcing Materials – Tor Steel, Plain Steel & their quality.	2	
	2.3 Different type of Structural Steel Section and application.	3	
	2.4 Use of Admixture in Cement Concrete & Plaster for improving Setting time, Strength, Waterproofing quality	4	
3	3. Types, Function & Method of Construction of different Parts of a building:		20
	3.1 Sub Structure - Earth work in excavation, B.F.S. work, P.C.C. work, Brick work in foundation D.P.C. work	7	
	3.2 Super Structure -Brick work, Lintel, Chajja, Arches, R.C.C. work, Plastering & Pointing Stair Case, Lift, Escalator, Roof, Flooring, Skirting.	8	
	3.3 Formwork for columns, footings, retaining walls (Shuttering) for floor beams & Slabs (Centering), Staging, Scaffolding,	3	
	3.4 Grill Work, Wooden works.	2	
<b>Total</b>			<b>45</b>

**SUBJECT: BUILDING CONSTRUCTION & MAINTENANCE****CLASS XII  
SEMESTER - IV****THEORY****FULL MARKS – 30****(SAQ AND LAQ Type Question)**

<b>UNIT</b>	<b>Topic</b>	<b>No of periods assigned</b>	<b>Marks</b>
1	<b>Construction of Building Service-related structures</b>	15	10
2	<b>Construction Equipment, machineries, tools and accessories</b>	12	5
3	<b>Local by-laws, building rules and Building Planning process:</b>	12	8
4	<b>Maintenance of Building and other structure</b>	14	5
5	<b>Maintenance related to building services</b>	10	2

**DETAIL SYLLABUS**

<b>UNIT</b>	<b>Topic / Sub Topic</b>	<b>No of periods assigned</b>	
		<b>Topic / Sub Topic</b>	<b>Total</b>
1	1. Construction of Building Service-related structures:		15
	1.1 Construction of building service-related works in Sanitary works.	8	
	1.2 Construction of building service-related works in plumbing Works.	7	
2	2. Construction Equipment, machineries, tools and accessories:		12
	2.1 Description of mason's hand tools such as trowel, straight edge, pipe level, plumb bob, wooden and metal float, right angled scale, measuring tape, brick layer's hammer	4	
	2.2 Description of machineries and equipment used in construction: Tractor, Bull dozer, Grader, Scraper, Basic shovel, Power shovel, Drag Line, Clam Shell, Back Hoe, Dumper Trucks, Road Roller, Sheep's Foot Roller, Concrete Mixers, Pump in Concrete, Concrete Vibrator, Crushers	8	
3	3. Local by-laws, building rules and Building Planning process:		12
	3.1 Local by-laws- Building Rules, Bengal Municipal Act, Panchayat Rules.	6	
	3.2 Principle of Building planning, Requirement of Open space, Classification of building, Ground coverage, FAR, covered area, Plinth area, built up area, super built up area.	6	
4	4. Maintenance of Building and other structure		14
	4.1 Management aspects -Scope of Civil Maintenance Works, Categories of Civil Maintenance works, Tool required for Civil Maintenance works, Management of Routine Maintenance works, Management of Preventive Maintenance, Management of Major Maintenance Works of Special Repairs, Costing of Civil Maintenance, Manpower Planning in Civil Maintenance	6	
	4.2 Technical Aspects-Cracks in Building, Seepage and Dampness in building, Painting works, Plastering works, Concrete works, PCC & RCC, Brick and Stone masonry, Wood Work, Structural Steel Work, Door Window Fittings, Flooring, Roofing and Drainage, Water Supply and Sewerage, Road Work, Functional Requirements of Buildings.	6	

	4.3 Useful Products and Chemicals used in Civil Maintenance- Name of different types of chemicals name of Manufacturer, compounds name, uses.	2	
5	5. Maintenance related to building services:		10
	5.1 Maintenance of Sanitary & Plumbing related works.	6	
	5.2 Maintenance of Electrical works.	4	
<b>Total</b>			<b>63</b>

Sl No.	Practical – 144 periods
1.	<p>Demonstrate the :</p> <ol style="list-style-type: none"> <li>1. Concept, properties and use of different Building materials involved in building construction.</li> <li>2. Sequence of construction of a building.</li> <li>3. Name of different parts of building.</li> <li>4. Classification and construction of different types of roads, component parts</li> <li>5. Concept of different construction work in Irrigation structure Diversion head work - Dams, Barrages, Weir, Reservoir and Canals.</li> </ol>
2.	<p><b>Describe the different Construction materials, their Characteristics, types, physical properties, field identification of quality and different fields' applications.</b></p> <ol style="list-style-type: none"> <li>1. aggregates,</li> <li>2. Bricks,</li> <li>3. Lime,</li> <li>4. Mineral admixture,</li> <li>5. Cement,</li> <li>6. Sand,</li> <li>7. Clay Products,</li> <li>8. Mortar</li> <li>9. Concrete including various concreting operations viz-<b>Selection of ingredients of concrete, Batching, Volume &amp; weigh batching, volume batching for nominal mixes, Transportation, placing, compaction &amp; finishing of concrete, Curing of concrete, durability of concrete and Carry out field and laboratory tests on concrete in fresh and hardened stage.</b></li> <li>10. Water proofing materials,</li> <li>11. Timber,</li> <li>12. Wood based products,</li> <li>13. Tar,</li> <li>14. Bitumen,</li> <li>15. Asphalt,</li> <li>16. Paint,</li> <li>17. 16 Varnishes,</li> <li>18. 17. Metal,</li> <li>19. 18. Plastics.</li> <li>20. 19. Reinforcing Materials – Tor Steel, Plain Steel &amp; their quality.</li> <li>20. Different type of Structural Steel Section and application.</li> <li>21. Use of Admixture in Cement Concrete &amp; Plaster for improving Setting time, Strength, Waterproofing quality</li> </ol>

3.	<p>Demonstrate the different parts of building and their functions and construction :</p> <ul style="list-style-type: none"> <li>a) Sub Structure – <ul style="list-style-type: none"> <li>i) Earth work in excavation</li> <li>ii) B.F.S. work</li> <li>iii) P.C.C. work</li> <li>iii) Brick work in foundation &amp; plinth</li> <li>iv) D.P.C. work</li> </ul> </li> <li>b) Super Structure – <ul style="list-style-type: none"> <li>i) Brick work</li> <li>ii) Formwork for columns, footings, retaining walls (Shuttering) , for floor beams &amp; Slabs(Centering).</li> <li>iii) Staging</li> <li>iv) Scaffolding</li> <li>v) Lintel, Chajja, Arches</li> <li>vi) R.C.C. work</li> <li>vii) Plastering &amp; Pointing</li> <li>viii) Grill works</li> <li>ix) Wooden works</li> <li>x) Stair Case, Lift, Escalator</li> <li>xi) Ventilator</li> <li>xii) Roof</li> <li>x) Flooring , Skirting</li> </ul> </li> </ul>
4	<p>Demonstrate the :a) Sanitary Works - House drainage of building, sanitary fittings, terms used in PHE, system of sanitation, Manholes &amp; Septic Tank.</p> <p>b) Plumbing Works - System of Plumbing, different fittings.</p>
5.	<p>Demonstrate the use of: mason’s hand tools such as trowel, straight edge, pipe level, plumb bob, wooden and metal float, right angled scale, measuring tape, brick layer’s hammer etc. Tractor, Bull dozer, Grader, Scraper, Basic shovel, Power shovel, Drag Line, Clam Shell, Back Hoe, Dumper Trucks, Road Roller, Sheep’s Foot Roller, Concrete Mixers, Pump in Concrete, Concrete Vibrator, Crushers.</p>
6.	<p>Describe the: Local by law- Building Rules, Bengal Municipal Act, Panchayat Rules, Principal of planning of building, Requirements of parts of buildings, Open space, Classification of building, Ground coverage, FAR, Covered area, Plinth area</p>
7.	<p>Demonstrate the:</p> <ul style="list-style-type: none"> <li>1) <b>Constructional parts maintenance –</b> <ul style="list-style-type: none"> <li>i) <b>Management aspects –</b> <ul style="list-style-type: none"> <li>a) Scope of Civil Maintenance Works</li> <li>b) Categories of Civil Maintenance works</li> <li>c) Tool and Tackles required for Civil Maintenance works</li> <li>d) Management of Routine Maintenance works</li> <li>e) Management of Preventive Maintenance</li> <li>f) Management of Major Maintenance Works of Special Repairs</li> <li>g) Costing of Civil Maintenance</li> <li>h) Manpower Planning in Civil Maintenance</li> </ul> </li> </ul> </li> </ul>

	<p>ii) <b>Technical Aspects –</b></p> <ul style="list-style-type: none"> <li>a) Cracks in Building</li> <li>b) Seepage and Dampness in building</li> <li>c) Painting works</li> <li>d) Plastering works</li> <li>e) Concrete works – PCC &amp; RCC</li> <li>f) Brick and Stone masonry</li> <li>g) Wood Work</li> <li>h) Structural Steel Work</li> <li>i) Door Window Fittings</li> <li>j) Flooring</li> <li>h) Roofing and Drainage</li> <li>i) Water Supply and Sewerage</li> <li>j) Road Work</li> <li>k) Functional Requirements of Buildings</li> </ul> <p>iii) <b>Useful Products and Chemicals for use in Civil Maintenance –</b> Name of different types of works, name of Manufacturer, compounds name, uses</p> <p>iv) <b>Suggested makes of materials for quality maintenance –</b> Name of different Materials Products and their brand name</p>
8.	<p>Demonstrate the:</p> <ul style="list-style-type: none"> <li>a) Sanitary &amp; Plumbing maintenance</li> <li>b) Electrical maintenance</li> </ul>

**Practical – 50 marks, Project – 20 marks**