



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)  
Dundigal, Hyderabad-500043

## CIVIL ENGINEERING

### TUTORIAL QUESTION BANK

<b>Course Title</b>	<b>REHABILITATION &amp; RETROFITTING OF STRUCTURES</b>				
<b>Course Code</b>	ACE505				
<b>Programme</b>	B. Tech				
<b>Semester</b>	VII	CE			
<b>Course Type</b>	Elective				
<b>Regulation</b>	<b>IARE - R16</b>				
<b>Course Structure</b>	<b>Theory</b>			<b>Practical</b>	
	<b>Lectures</b>	<b>Tutorials</b>	<b>Credits</b>	<b>Laboratory</b>	<b>Credits</b>
	3	-	3	-	-
<b>Chief Coordinator</b>	Mr. A. Jagadish Babu, Assistant Professor				
<b>Course Faculty</b>	Mr. A. Jagadish Babu, Assistant Professor				

#### COURSE OBJECTIVES:

<b>The course should enable the students to:</b>	
I	Explain different types of deterioration of structures, distress in structures and damage mechanism.
II	Understand the aspects of repair and rehabilitation and facets of maintenance.
III	Apply the various techniques of repair for corrosion protection in structures.
IV	Illustrate different methods for strengthening the existing structures and methods of demolition of structures using engineered and non-engineered techniques.

#### COURSE OUTCOMES (COs):

CO 1	Recognize the mechanisms of deterioration of structures and conduct Preliminary forensic assessment of deteriorated concrete structures.
CO 2	Analyze the maintenance and diagnosis of failure.
CO 3	Able to Examine the damages occurred in reinforced concrete building and knowing the remedies for damages.
CO 4	Knowing about different types of special materials used for repair techniques.
CO 5	Identifying different types of strengthening techniques used for existing structures.

#### COURSE LEARNING OUTCOMES (CLOs):

ACE505.01	Describe the deterioration of structures, rehabilitation and retrofitting.
ACE505.02	Identifying the causes for deterioration of structures and able to give the preventive measures for it.
ACE505.03	Describe the mechanism of damage and types of damage.
ACE505.04	Analyzing the damage of structures in detail.
ACE505.05	Understand the distress in structures.
ACE505.06	Understand what is meant by Maintenance, repair and rehabilitation

ACE505.07	Understand the facets of maintenance: i)Prevention ii)Repair
ACE505.08	Describe the various aspects of inspection.
ACE505.09	Understand the Assessment procedure for evaluating a damaged structure.
ACE505.10	Identifying the diagnosis of construction failures.
ACE505.11	Describe the Corrosion damage of reinforced concrete.
ACE505.12	Describe the Corrosion inhibitors, Corrosion resistant steels, cathodic protection and rust eliminators.
ACE505.13	Describe the causes for deterioration of concrete, steel, masonry and timber structures.
ACE505.14	Discuss the concept of surface deterioration, efflorescence and corrosion protection.
ACE505.15	Discuss different causes and preventive measures of surface deterioration and efflorescence.
ACE505.16	Describe special concrete and mortar.
ACE505.17	Discuss different types of special concrete such as polymer concrete sulphur infiltrated concrete, fiber reinforced concrete, ferro cement and expansive cement.
ACE505.18	Discuss different methods of repair in concrete, steel, masonry and timber structures.
ACE505.19	Describe about expansive cement.
ACE505.20	Describe about sulphur infiltrated concrete.
ACE505.21	Describe strengthening techniques for existing structures.
ACE505.22	Describe Various repair works to overcome low member strength, deflection, cracking, chemical disruption, weathering, wear, fire, leakage, marine exposure.
ACE505.23	Describe the use of Non –destructive techniques for evaluation.
ACE505.24	Describe a case study of demolition of structure using engineered technique.
ACE505.25	Describe some of the non-engineered techniques used for demolition of structures.

## TUTORIAL QUESTION BANK

UNIT- I				
INTRODUCTION				
Part - A (Short Answer Questions)				
S No	QUESTIONS	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes (CLOs)
1	Define the term distress.	Remember	CO 1	ACE505.05
2	Name different types of distress.	Remember	CO 1	ACE505.05
3	What is meant by renovation?	Understand	CO 1	ACE505.02
4	What is meant by rehabilitation?	Understand	CO 1	ACE505.01
5	Define the term restoration.	Remember	CO 1	ACE505.01
6	Define repair in a structure.	Understand	CO 1	ACE505.02
7	What is retrofitting?	Remember	CO 1	ACE505.01
8	What is remodeling?	Remember	CO 1	ACE505.01
9	What is deterioration in a structure?	Understand	CO 1	ACE505.01
10	Write a short note on honey combing.	Remember	CO 1	ACE505.01
11	Write a short note on cracking.	Remember	CO 1	ACE505.01
12	Write a short note on settlement.	Remember	CO 1	ACE505.01
13	Write a short note on spalling.	Remember	CO 1	ACE505.01
14	Write a short note on causes of damages in fresh state.	Understand	CO 1	ACE505.03
15	Write a short note on causes of damages after hardening.	Understand	CO 1	ACE505.03
16	Write a short note on physical causes of damages after hardening.	Understand	CO 1	ACE505.04
17	Write a short note on chemical causes of damages after hardening.	Understand	CO 1	ACE505.04
18	Write a short note on thermal causes of damages after hardening.	Understand	CO 1	ACE505.04
19	Define setting shrinkage.	Remember	CO 1	ACE505.04
20	What is aggregate shrinkage?	Understand	CO 1	ACE505.04
Part - B (Long Answer Questions)				
1	What do you mean by deterioration? Explain the mechanism of deterioration in concrete structures?	Understand	CO 1	ACE505.01
2	Discuss in detail the various factors responsible for deterioration.	Understand	CO 1	ACE505.02
3	Discuss in detail various construction stage defects & their preventive measures?	Remember	CO 1	ACE505.02
4	What are the various pre-construction stage damages and how can it be rectified?	Remember	CO 1	ACE505.03
5	Explain the mechanism of various causes of deterioration in post- construction stage?	Understand	CO 1	ACE505.02
6	Explain the cracking phenomena in plastic concrete. Give the remedial measures.	Understand	CO 1	ACE505.04
7	What are settlement cracks? What are the factors affecting the settlement cracks?	Remember	CO 1	ACE505.04
8	Explain mechanism of cracking, causes of cracking. Give the remedial measures.	Remember	CO 1	ACE505.04
9	Write the different reasons for development of cracks due to errors in design and detailing. Give preventive measures.	Understand	CO 1	ACE505.04
10	Name various chemical attacks in concrete & Explain their mechanism in detail. Give the preventive measures?	Remember	CO 1	ACE505.01
11	Explain sulphate reaction in detail. Give various preventive measures?	Understand	CO 1	ACE505.01
12	What is carbonation, factors effecting carbonation? Explain its mechanism in details, suggest suitable remedial measures.	Remember	CO 1	ACE505.02
13	What is distress? Give its classification.	Remember	CO 1	ACE505.05

14	Explain in detail various causes of damage in fresh state? Suggest the suitable remedial measures?	Understand	CO 1	ACE505.02
15	Explain in detail regarding mechanism of creep in concrete and their remedial measures?	Understand	CO 1	ACE505.03
16	Discuss the affects of freezing and thawing of structures and give remedial measures.	Remember	CO 1	ACE505.02
17	Explain in detail regarding mechanism of accidental overloads in concrete and their remedial measures.	Understand	CO 1	ACE505.06
18	Discuss in detail the cracking of hardened concrete.	Remember	CO 1	ACE505.04
19	Explain in detail regarding mechanism of temperature variation in concrete and their remedial measures.	Understand	CO 1	ACE505.02
20	Describe the causes for distress in detail?	Remember	CO 1	ACE505.05
<b>Part - C (Critical Thinking Questions)</b>				
1	What is distress? Give its classification.	Remember	CO 1	ACE505.05
2	What are the various categories of deterioration?	Remember	CO 1	ACE505.01
3	What are the causes for deterioration in a structure and write its preventive measures?	Understand	CO 1	ACE505.02
4	What are the causes for distress in a structure and write its preventive measures?	Understand	CO 1	ACE505.06
5	Write about mechanism of damage and describe about types of damage?	Understand	CO 1	ACE505.03
6	Write a Short note on damage under cyclic loading?	Understand	CO 1	ACE505.06
7	Describe about cracking in a structure and its types?	Remember	CO 1	ACE505.04
8	How evaluation of damage is done and describe about damage assessment?	Understand	CO 1	ACE505.04
9	How many types of damages are there and describe it?	Understand	CO 1	ACE505.03
10	Write a short note on cyclic loads and how it effects a structure?	Remember	CO 1	ACE505.06
<b>UNIT -II</b>				
<b>MAINTENANCE AND DIAGNOSIS OF FAILURE</b>				
<b>Part – A (Short Answer Questions)</b>				
1	Define Maintenance.	Understand	CO 2	ACE505.07
2	Define Repair.	Understand	CO 2	ACE505.07
3	Define Rehabilitation.	Understand	CO 2	ACE505.07
4	What are the two facets of maintenance?	Remember	CO 2	ACE505.08
5	Define physical inspection of damaged structure.	Understand	CO 2	ACE505.09
6	What are the steps in selecting a repair procedure?	Remember	CO 2	ACE505.08
7	Define the fixed percentage method of evaluating the strength of existing structure.	Understand	CO 2	ACE505.10
8	What are the possible decisions that can be made after evaluating the strength of a structure?	Understand	CO 2	ACE505.10
9	How can we evaluate the strength of existing structure by stress analysis?	Remember	CO 2	ACE505.10
10	What are the facts of maintenance?	Remember	CO 2	ACE505.07
11	Write down the importance of maintenance.	Remember	CO 2	ACE505.07
12	Write any assessment procedure for evaluating the structure.	Understand	CO 2	ACE505.07
13	What are the stages inspection and maintenance?	Understand	CO 2	ACE505.09
14	How repairing techniques can be classified?	Remember	CO 2	ACE505.07
15	What are the materials used for Repairs and Rehabilitation of Concrete Structures?	Remember	CO 2	ACE505.07
16	What is construction failure?	Understand	CO 2	ACE505.11
17	Why do some structures fail?	Understand	CO 2	ACE505.11
18	What is meant by visual inspection?	Understand	CO 2	ACE505.09
19	What are the causes for concrete failure in a structure?	Understand	CO 2	ACE505.11
20	Write about diagnosis of failure?	Understand	CO 2	ACE505.11
<b>Part - B (Long Answer Questions)</b>				
1	Write about maintenance and its necessary for a structure to increase durability?	Understand	CO 2	ACE505.07

2	Write about repair and rehabilitation in detail?	Remember	CO 2	ACE505.07
3	Describe two facets of maintenance?	Remember	CO 2	ACE505.08
4	Write about various aspects of inspection in detail?	Understand	CO 2	ACE505.09
5	Write the steps for failure and describe each step?	Remember	CO 2	ACE505.11
6	Evaluate the need for repair?	Remember	CO 2	ACE505.08
7	Describe in detail about the repair aspect of maintenance?	Understand	CO 2	ACE505.08
8	Write about types of inspection for a structure?	Remember	CO 2	ACE505.09
9	What is damage identification analysis?	Understand	CO 2	ACE505.09
10	What are the various structural evaluation methods?	Understand	CO 2	ACE505.10
11	Write the reasons for construction failure in detail?	Remember	CO 2	ACE505.11
12	What are the causes for building failure?	Understand	CO 2	ACE505.11
13	Describe the steps in assessment procedure for evaluate damages in structure?	Remember	CO 2	ACE505.10
14	What are the materials used for Repairs and Rehabilitation of Concrete Structures?	Understand	CO 2	ACE505.07
15	What are the steps in selecting a repair procedure?	Remember	CO 2	ACE505.07
16	Discuss about the environment effects which leads to deterioration of concrete structure.	Remember	CO 2	ACE505.15
17	What is the effect of selecting poor quality material for construction?	Remember	CO 2	ACE505.06
18	Discuss about the quality of supervision to be followed at a site.	Understand	CO 2	ACE505.09
19	What are the possible decisions after finding a structure to be inadequate?	Remember	CO 2	ACE505.09
20	What are the causes of deterioration?	Remember	CO 2	ACE505.15

**Part - C (Critical Thinking Questions)**

1	Describe the steps in assessment procedure for evaluate damages in structure?	Remember	CO 2	ACE505.10
2	Explain the various causes for deterioration of concrete structures?	Understand	CO 2	ACE505.12
3	Describe in detail about the prevention aspect of maintenance?	Remember	CO 2	ACE505.08
4	Describe in detail about the repair aspect of maintenance?	Understand	CO 2	ACE505.08
5	Write about types and classification of failure?	Remember	CO 2	ACE505.11
6	What are the methodologies used in diagnosis of failure?	Understand	CO 2	ACE505.11
7	Describe any one method for evaluating a damaged structure?	Understand	CO 2	ACE505.10
8	Write in detail about importance of maintenance?	Remember	CO 2	ACE505.07
9	Why rehabilitation is necessary and write a short note on it?	Understand	CO 2	ACE505.07
10	Write in detail about various aspects of maintenance?	Understand	CO 2	ACE505.07

**UNIT –III**

**DAMAGES AND THEIR REMEDIES**

**Part - A (Short Answer Questions)**

1	Give some examples for corrosion inhibitors?	Remember	CO 3	ACE505.14
2	Define corrosion inhibitor?	Remember	CO 3	ACE505.14
3	Write about corrosion of reinforcement in concrete?	Remember	CO 3	ACE505.14
4	How is stainless steel corrosion resistant?	Understand	CO 3	ACE505.14
5	What are the methods to prevent corrosion?	Understand	CO 3	ACE505.14
6	What is meant by Cathodic protection?	Understand	CO 3	ACE505.14
7	How do you stop concrete from deteriorating?	Understand	CO 3	ACE505.15
8	What can damage concrete?	Understand	CO 3	ACE505.12
9	What are the major causes of deterioration in historic masonry structures?	Understand	CO 3	ACE505.15
10	How does timber deteriorate?	Remember	CO 3	ACE505.15

11	What causes efflorescence?	Remember	CO 3	ACE505.17
12	What is embedded steel?	Remember	CO 3	ACE505.14
13	What causes concrete to deteriorate?	Understand	CO 3	ACE505.15

14	Write about surface deterioration?	Understand	CO 3	ACE505.16
15	Describe rust eliminators?	Remember	CO 3	ACE505.14
16	Write about corrosion resistant steel?	Remember	CO 3	ACE505.14
17	Write causes and preventive measures for efflorescence?	Understand	CO 3	ACE505.17
18	Describe about coatings for embedded steel?	Understand	CO 3	ACE505.14
19	Write the causes for deterioration of concrete?	Remember	CO 3	ACE505.15
20	Write the causes for deterioration of steel?	Remember	CO 3	ACE505.15
<b>Part – B (Long Answer Questions)</b>				
1	Discuss the factors affecting corrosion. What are its effects.	Understand	CO 3	ACE505.12
2	Explain the mechanism of corrosion; name the corrosion inhibitors and promoters.	Understand	CO 3	ACE505.12
3	What are the factors effecting chloride induced corrosion? Explain in detail mechanism of chloride induced corrosion and suggest suitable remedial measures?	Understand	CO 3	ACE505.13
4	Explain in detail mechanism of carbonation induced corrosion, suggest suitable remedial measures.	Understand	CO 3	ACE505.12
5	Explain in detail cathodic corrosion protection, lectrochemical chloride extraction, galvanic protection system. Suggest its suitability depending on the problem.	Understand	CO 3	ACE505.13
6	Write about the embedded metal corrosion and tolerable crack widths to avoid the rebar corrosion.	Remember	CO 3	ACE505.14
7	Write in detail about the factors influencing the cracking and spalling and mention regarding C/D ratio.	Remember	CO 3	ACE505.16
8	Describe about rust eliminators in detail?	Remember	CO 3	ACE505.14
9	How deterioration of a structure happens by spalling of concrete?	Understand	CO 3	ACE505.15
10	How can we prevent timber deterioration? Explain in detail	Understand	CO 3	ACE505.15
11	What are the methods to prevent corrosion?	Remember	CO 3	ACE505.13
12	Write about the embedded metal corrosion and tolerable crack widths to avoid the rebar corrosion.	Understand	CO 3	ACE505.14
13	Write the causes and preventive measures for efflorescence?	Remember	CO 3	ACE505.16
14	How can we determine the cause for deterioration of concrete structure?	Understand	CO 3	ACE505.15
15	Discuss about the design and construction errors leading to deterioration of a structure.	Remember	CO 3	ACE505.15
16	Write about alkali-aggregate reaction related to deterioration of concrete?	Understand	CO 3	ACE505.15
17	Write about carbonation effect of concrete?	Understand	CO 3	ACE505.16
18	What is the use of coatings in steel embedded in concrete?	Remember	CO 3	ACE505.14
19	What causes steel to deteriorate in concrete ?Explain with an example	Remember	CO 3	ACE505.15
20	What are the preventive measures for salt attack?	Understand	CO 3	ACE505.16
<b>Part – C (Critical Thinking Questions)</b>				
1	Write notes on symptoms of corrosion.	Understand	CO 3	ACE505.12
2	Write about preventive measures that ensure good protection for new structures.	Understand	CO 3	ACE505.14
3	Explain the method of repairing corroded steel in R.C structure	Remember	CO 3	ACE505.12
4	Write about the embedded metal corrosion and tolerable crack widths to avoid the rebar corrosion.	Understand	CO 3	ACE505.14
5	Write about methods of corrosion protection?	Remember	CO 3	ACE505.14
06	Describe about rust eliminators?	Remember	CO 3	ACE505.14
07	Write the causes for deterioration of concrete in detail?	Remember	CO 3	ACE505.15
08	Write in detail about surface deterioration?	Understand	CO 3	ACE505.16

09	What is meant by cathodic protection and how it is used in structures?	Understand	CO 3	ACE505.14
10	What are the causes for deterioration of timber structures?	Understand	CO 3	ACE505.15
<b>UNIT –IV</b>				
<b>MATERIALS AND TECHNIQUES OF REPAIR</b>				
<b>Part – A (Short Answer Questions)</b>				
1	What is expansive cement?	Remember	CO 4	ACE505.19
2	What is the action of shrink comb in expansive cement?	Understand	CO 4	ACE505.19
3	List the various types of polymer concrete.	Remember	CO 4	ACE505.19
4	Give the various monomers used in polymer concrete.	Remember	CO 4	ACE505.19
5	Define polymer concrete?	Remember	CO 4	ACE505.19
6	What are the uses of Polymer concrete?	Remember	CO 4	ACE505.19
7	What is sulphur infiltrated concrete?	Understand	CO 4	ACE505.19
8	What are the applications of sulphur infiltrated concrete?	Understand	CO 4	ACE505.19
9	What are the types of special concrete?	Remember	CO 4	ACE505.18
10	Write a short note on Expansive cement?	Remember	CO 4	ACE505.19
11	Define Guniting or Shotcrete?	Understand	CO 4	ACE505.18
12	What are the methods involved in Epoxy injection?	Understand	CO 4	ACE505.20
13	What are the four steps to built up the epoxy system?	Remember	CO 4	ACE505.20
14	What are the overlays of polymer concrete?	Remember	CO 4	ACE505.19
15	What is meant by epoxide resins?	Remember	CO 4	ACE505.20
16	Write about GGBS Concrete?	Remember	CO 4	ACE505.18
17	How Expansive cement is made?	Understand	CO 4	ACE505.19
18	Write any three types of special concrete?	Understand	CO 4	ACE505.18
19	What are the ingredients used in polymer concrete?	Remember	CO 4	ACE505.19
20	What are the ingredients used in sulphur infiltrated concrete?	Remember	CO 4	ACE505.19
<b>Part – B (Long Answer Questions)</b>				
1	Explain the process of guniting in detail with figure.	Understand	CO 4	ACE505.20
2	Enumerate the different methods available for repairs of concrete works. Discuss the any one in detail.		CO 4	ACE505.20
3	What is jacketing? What are the different types of jacketing?	Understand	CO 4	ACE505.20
4	Explain the concrete column in detail with figure.	Understand	CO 4	ACE505.21
5	Describe the manufacturing process of fiber reinforced concrete?	Remember	CO 4	ACE505.18
6	Describe the manufacturing process of ferro cement?	Remember	CO 4	ACE505.18
7	What are concrete chemicals? Name any three chemicals used in concrete and describe them.	Understand	CO 4	ACE505.20
8	Write about the expansive cement and its uses?	Understand	CO 4	ACE505.19
9	Define Guniting and their uses?	Understand	CO 4	ACE505.18
10	Write about commonly used concrete admixtures?	Remember	CO 4	ACE505.20
11	Write any four types of chemical admixtures and its uses?	Remember	CO 4	ACE505.20
12	How epoxy resin is useful in concrete and how long does epoxy resin last?	Understand	CO 4	ACE505.18
13	What is the difference between shotcrete and guniting?	Understand	CO 4	ACE505.18
14	What are the advantages of shotcrete?	Remember	CO 4	ACE505.18
15	What are the advantages of guniting?	Remember	CO 4	ACE505.18
16	What are the advantages of epoxy injection in concrete?	Remember	CO 4	ACE505.18
17	Write about high density concrete?	Understand	CO 4	ACE505.18
18	What are the advantages of high density concrete?	Remember	CO 4	ACE505.18
19	What are the advantages of self compacting concrete?	Remember	CO 4	ACE505.18
20	What are the advantages of light weight concrete?	Remember	CO 4	ACE505.18
<b>Part – C (Critical Thinking Questions)</b>				
1	Describe the manufacturing process of high density concrete?	Remember	CO 4	ACE505.18
2	Describe the manufacturing process of self compacting concrete?	Remember	CO 4	ACE505.18



3	What is the difference between shotcrete and guinite?	Understand	CO 4	ACE505.20
4	Write about commonly used concrete admixtures?	Remember	CO 4	ACE505.20
5	Enumerate the different methods available for repairs of concrete works. Discuss the any one in detail.	Understand	CO 4	ACE505.20
6	What do you mean by leak sealing? Discuss the various methods of leak sealing.	Remember	CO 4	ACE505.20
7	Write the difference between conventional concrete and self compacting concrete?	Understand	CO 4	ACE505.18
8	How epoxy resin is useful in concrete and how long does epoxy resin last?	Understand	CO 4	ACE505.18
9	Write the advantages of Epoxy resin in concrete?	Remember	CO 4	ACE505.18
10	Write any five types of chemical admixtures and its uses?	Remember	CO 4	ACE505.20

### UNIT - V

#### STRENGTHENING AND DEMOLITION ASPECT

##### Part - A (Short Answer Questions)

1	What are the techniques required for repairing cracks?	Remember	CO 5	ACE505.21
2	Define stitching.	Understand	CO 5	ACE505.21
3	What do you mean by blanketing?	Remember	CO 5	ACE505.21
4	Define external stressing?	Understand	CO 5	ACE505.21
5	What is meant by Autogenous healing?	Understand	CO 5	ACE505.22
6	Give short note on Jacketing.	Remember	CO 5	ACE505.22
7	Define grouting?	Remember	CO 5	ACE505.22
8	What is caging with steel?	Understand	CO 5	ACE505.22
9	What is mean by weathering?	Remember	CO 5	ACE505.22
10	What are the preliminary investigations before demolition of a structure?	Understand	CO 5	ACE505.24
11	Write about protective ACE505thing given before demolition?	Understand	CO 5	ACE505.24
12	Write short notes on demolition by hand?	Understand	CO 5	ACE505.24
13	What are the Principles of dismantling?	Remember	CO 5	ACE505.25
14	What are the modern demolition techniques?	Remember	CO 5	ACE505.24
15	What are the types of Hand Held Machine?	Remember	CO 5	ACE505.25
16	What is fire rating?	Understand	CO 5	ACE505.22
17	Write about changes observed in concrete in fire.	Remember	CO 5	ACE505.22
18	How does the strength of concrete vary due to rise in temperature?	Understand	CO 5	ACE505.22
19	What happens to concrete in fire?	Understand	CO 5	ACE505.22
20	Name various stages of repair of fire damaged elements.	Remember	CO 5	ACE505.22

##### Part - B (Long Answer Questions)

1	What are the effective factors in choosing strengthening techniques?	Understand	CO 5	ACE505.21
2	Write about steel jacketing and how it is helpful in strengthening of a structure?	Understand	CO 5	ACE505.22
3	What are settlement cracks? What are the factors affecting the settlement cracks?	Understand	CO 5	ACE505.22
4	Write about FRP laminates or FRP wrapping in concrete?	Understand	CO 5	ACE505.22
5	What are the reasons to use FRP laminates?	Remember	CO 5	ACE505.22
6	Write about different types FRP covers based on production?		CO 5	ACE505.22
7	Write the uses of FRP Laminates related to concrete?	Remember	CO 5	ACE505.22
8	Describe strengthening techniques for existing structures?	Understand	CO 5	ACE505.21
9	What is the role of NDT in qualifying the structure after retrofitting?	Remember	CO 5	ACE505.23
10	Explain the procedure to perform Pull-out test with figure.	Remember	CO 5	ACE505.23
11	Explain commonly used NDT tests and Write its advantages over other tests.	Understand	CO 5	ACE505.23
12	Describe ultrasonic pulse velocity test of concrete members with sketch.	Remember	CO 5	ACE505.23



13	Explain the testing procedure of rebound hammer method clearly.	Remember	CO 5	ACE505.23
14	Write the procedure and limitations of rebound hammer method.	Understand	CO 5	ACE505.23
15	Explain the testing procedure of ultra sonic pulse velocity clearly.	Remember	CO 5	ACE505.23
16	Evaluate the test method vulnerability of reinforced concrete structure.	Remember	CO 5	ACE505.23
17	Write a case study about demolition of structure using engineered technique?	Remember	CO 5	ACE505.24
18	Write a case study about demolition of structure using Non engineered technique?	Remember	CO 5	ACE505.25
19	Write about use of non-destructive tests?	Understand	CO 5	ACE505.23
20	Write in detail about load testing of a structure?	Remember	CO 5	ACE505.22
<b>Part – C (Critical Thinking Questions)</b>				
1	Demonstrate the ultrasonic pulse velocity test of concrete members with sketch and write applications.	Understand	CO 5	ACE505.23
2	Explain various methods of crack detection?	Remember	CO 5	ACE505.22
3	Explain commonly used NDT tests and Write its advantages over other tests.	Remember	CO 5	ACE505.23
4	Write a case study about demolition of structure using engineered technique?	Remember	CO 5	ACE505.24
5	Explain the testing procedure of rebound hammer method clearly.	Understand	CO 5	ACE505.23
6	Explain the testing procedure of ultra sonic pulse velocity clearly.	Remember	CO 5	ACE505.23
7	Write some of the strengthening techniques of existing Rcc structure?	Understand	CO 5	ACE505.21
8	Write the uses of FRP Laminates related to concrete?	Understand	CO 5	ACE505.21
9	Write about steel jacketing and how it is helpful in strengthening of a structure?	Understand	CO 5	ACE505.22
10	What are settlement cracks? What are the factors affecting the settlement cracks?	Remember	CO 5	ACE505.22

**Prepared by:**

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