Hall Ticket No | | | | | | | | | | | Question Paper Code: ACE505

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER

B.Tech VIII Semester End Examinations, May- 2020

Regulations: R16

REHABILITATION & RETROFITTING OF STRUCTURES

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT– I

1.	a)	Explain the Stages in Deterioration of Structures?	**[7M]**
	b)	Write the causes and preventive aspects of Distress in structures?	**[7M]**
2.	a)	Write about damage under accidental and cyclic load?	**[7M]**
	b)	Describe about different types of cracking in structures?	**[7M]**

UNIT – II

3.	a)	What is meant by maintenance and describe any two facets of maintenance?	**[7M]**
	b)	Why repair and rehabilitation is necessary for structures and explain in detail?	**[7M]**
4.	a)	Write the assessment procedure for evaluating a damaged structure?	**[7M]**
	b)	Describe about diagnosis of construction failures?	**[7M]**

UNIT – III

5.	a)	Describe any two methods of corrosion protection?	**[7M]**
	b)	Describe about corrosion inhibitors and corrosion resistant steel?	**[7M]**
6.	a)	Write the causes for deterioration of steel?	**[7M]**
	b)	Write in detail about surface deterioration of concrete and its preventive measures?	**[7M]**

UNIT – IV

7.	a)	Write the manufacturing process of Sulphur Infiltrated Concrete?	**[7M]**
	b)	Write the manufacturing process of Polymer Concrete?	**[7M]**
8.	a)	Write in detail about the advantages of fiber reinforced concrete?	**[7M]**
	b)	Write the advantages of Gunite and shotcrete?	**[7M]**

UNIT – V

9.	a)	Write about demolition of structures using engineered technique?	**[7M]**
	b)	Explain any two types of Non-Destructive Tests?	**[7M]**
10.	a)	Explain in detail about Strengthening of Beams with Jacketing Technique?	**[7M]**
	b)	What is the role of NDT in qualifying the structure after retrofitting?	**[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

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.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	ACE505.01	Describe the deterioration of structures, rehabilitation and retrofitting.	CO 1	Remember
	b	ACE505.05	Understand the distress in structures.	CO 1	Understand
2	a	ACE505.03	Describe the mechanism of damage and types of damage.	CO 1	Remember
	b	ACE505.04	Analyzing the damage of structures in detail.	CO 1	Remember
3	a	ACE505.07	Understand the facets of maintenance.	CO 2	Understand
	b	ACE505.06	Understand what is meant by Maintenance, repair and rehabilitation	CO 2	Understand
4	a	ACE505.09	Understand the Assessment procedure for evaluating a damaged structure.	CO 2	Understand
	b	ACE505.10	Identifying the diagnosis of construction failures.	CO 2	Remember
5	a	ACE505.11	Describe the Corrosion damage of reinforced concrete.	CO 3	Remember
	b	ACE505.12	Describe the Corrosion inhibitors, Corrosion resistant steels, cathodic protection and rust eliminators.	CO 3	Understand
6	a	ACE505.13	Describe the causes for deterioration of concrete, steel, masonry and timber structures.	CO 3	Remember
	b	ACE505.14	Discuss the concept of surface deterioration, efflorescence and corrosion protection.	CO 3	Remember
7	a	ACE505.20	Describe about sulphur infiltrated concrete.	CO 4	Understand
	b	ACE505.17	Discuss different types of special concrete such as polymer concrete, sulphur infiltrated concrete, fiber reinforced concrete, ferro cement and expansive cement.	CO 4	Remember
8	a	ACE505.16	Describe special concrete and mortar.	CO 4	Understand
	b	ACE505.18	Discuss different methods of repair in concrete, steel, masonry and timber structures.	CO 4	Understand
9	a	ACE505.24	Describe a case study of demolition of structure using engineered technique.	CO 5	Remember
	b	ACE505.23	Describe the use of Non –destructive techniques for evaluation.	CO 5	Understand
10	a	ACE505.21	Describe strengthening techniques for existing structures.	CO 5	Remember
	b	ACE505.23	Describe the use of Non –destructive techniques for evaluation.	CO 5	Understand

Signature of Course Coordinator **HOD, CE**