

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, January 2021

Course: Advanced Concrete Structures	Semester: I
Program: M.Tech Civil Engg	Time: 03 hrs.
Course Code: CIVL 7005	Max. Marks: 100

Instructions: All questions are compulsory. Use of notes, codes and other reference material is permitted.

SECTION A (30 Marks)

S. No.		Marks	CO
Q 1	<p>A single floor guest house is to be constructed in an industrial organization campus for its visitors as well for holding meetings/training programs. Plan the guest house showing location of all these units.</p> <p>You are free to add more units as per need. Use precast structural members i.e. all beams, slabs and columns and show them clearly in the guest house plan. Read all questions in section A for complete understanding of question.</p> <p>The guest house plan with all the part of Section A can be uploaded in Question 7 in Section- B.</p> <p>The guest house is required to have the following units</p> <ul style="list-style-type: none"> • Four double bed suites 	5	CO1
Q 2	<p>In continuation of Q1. Another unit in guest house is</p> <ul style="list-style-type: none"> • One hall for holding meetings 	5	CO1
Q 3	<p>In continuation of Q1. Another unit in guest house is</p> <ul style="list-style-type: none"> • One hall for training programs 	5	CO1
Q 4	<p>In continuation of Q1. Another unit in guest house is</p> <ul style="list-style-type: none"> • Pantry 	5	CO1
Q 5	<p>In continuation of Q1. Another unit in guest house is</p> <ul style="list-style-type: none"> • Common Room 	5	CO1
Q 6	<p>In continuation of Q1. Another unit in guest house is</p> <ul style="list-style-type: none"> • Portico 	5	CO1

SECTION B (50 Marks)

Q 7	<p>Upload the industrial guest house plan prepared in Questions in Section –A. Identify the structural elements i.e. a typical precast beam, column and slab and design it for vertical loads as per IS code, using prestressed concrete. Assume M40 concrete</p>	10	CO2
-----	---	-----------	------------

	and prestressing wires of 3mm diameter having UTS as 1300 MPa. Any other data considered necessary may be suitably assumed and clearly stated. Design as follows: Identification of structural elements in guest house plan, and fixing their dimensions.		
Q 8	In continuation of Q7 of section B. Do the following: Calculation of prestressing force and eccentricity. Sketch all design details clearly.	10	CO2
Q 9	In continuation of Q7 of section B. Do the following: Checking of stresses and Design of Precast beam section Sketch all design details clearly.	10	CO2
Q 10	In continuation of Q7 of section B. Do the following: Checking of stresses and Design of Precast column section Sketch all design details clearly.	10	CO2
Q 11	In continuation of Q7 of section B. Calculate the following: Checking of stresses and Design of Precast slab section. Sketch all design details clearly.	10	CO2
SECTION-C (20 Marks)			
Q 12	A basement is required to be constructed in the uploaded guest house plan for parking of vehicles. Design the walls of the basement. Following data may be assumed: <ul style="list-style-type: none"> • Height of basement walls= 4m • M40 concrete and prestressing wires of 3mm diameter having UTS as 1300 MPa. Any other data considered necessary may be suitably assumed and clearly stated. OR The management of industrial organization decides to add a silo behind the guest house, for storage of dry and compacted ash before disposal. If the daily production of ash is 80 tons and disposal is possible after three days only, design the silo for sufficient storage capacity. M40 concrete and prestressing wires of 3mm diameter having UTS as 1300 MPa.	20	CO3