NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Engineering and Technology
Program: M.Tech – Structural Engineering
Year: 2nd **Semester:** 3rd
Examination: End Semester Examination
Examination year: December - 2021

Course Code: SE220 **Course Name:** Prestressed Concrete
Date: 01/12/2021
Time: 11:30 a.m. to 01:30 p.m.

Total Marks: 40
Total Pages: 02

Instructions:

→ Write each answer on a new page.
→ Use of a calculator is permitted
→ Assume suitable data if required and mention the same

Q. No.	Details	Marks	COs*	BTL#
Q.1	The prestressed section of following properties is spanning over 20 m. The section is prestressed by 7 cables , each carrying effective force of 620 kN located 200 mm from soffit at centre of span section.If the total maximum bending moment at the centre of span of the girder is 3660 kN-m , estimate the resultant stress developed at section. Properties of section $A = 62 \times 10^4$ mm^2 $y_t = 646$ mm and $y_b = 854$ mm $I = 1727 \times 10^8$ mm^4 $Z_t = 2.67 \times 10^8$ mm^3 $Z_b = 2.02 \times 10^8$ mm^3	06	CO1 CO3	BT3,BT5
Q.2	A rectangular concrete beam of size 300 mm x 600 mm is pre stressed by force of 700 kN at a constant eccentricity of 120 mm at center and 60 mm at ends. The beam supports concentrated point load of 100 kN at center of span of 5 m. Draw pressure line mentioning center, quarter and end location. Required additional data can be assumed and mentioned	08	CO2 CO3	BT3,BT4
Q.3	Determine the initial prestress force distribution along the beam if the anchorage draw-in is 5mm. Given the following: Span = 18 m	08	CO3	BT3

	μ = 0.22 & K = 12 x 10⁻⁴ per metre σ_{po} = 1600 N/mm² , A_{ps} = 3300 mm² e at both ends = 0, e at mid span = 500 mm , E_s = 205 kN/mm²			
Q.4	Answer the following *(Any 03)*	18		
	1. How Shear streses are important for design of pre stressed concrete? Enlist methods for shear design for prestressed concrete. 2. How anchcorage zone in post tensioned prestressed member can be an important design parameter? Discuss stress distribution in end block. 3. Enlist and explain the design steps for pre tentioned flexural members for pre stressed concrete. 4. Listout the disadvantages encountered in continuous prestressed concrete.Explain any one method of analyzing secondary moments.		CO2 CO5	BT2,BT3,BT1

*************End of Question Paper************