



**K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**SESSION: 2023-2024 (EVEN SEMESTER)**  
**I SESSIONAL TEST QUESTION PAPER**  
**SET-B**

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Degree : B.E  
Branch : Civil Engineering  
Course Title : Design of Pre stressed concrete Elements  
Duration : 90 Minutes

Semester : VIII  
Course Code : 18CV81  
Date : 12/04/2024  
Max Marks : 30

**Note: Answer ONE full question from each part.**

Q No.	Question	Marks	K-Level	CO mapping
<b>PART-A</b>				
1(a)	<b>Explain</b> the necessity of high strength concrete and high strength steel is used in Pre stress concrete.	5	<b>K2</b> Understanding	CO1
(b)	<b>Explain</b> the advantages of PSC over RCC.	5	<b>K2</b> Understanding	CO1
(c)	<b>Explain</b> the various types of losses in Pre-Tensioning system.	5	<b>K2</b> Understanding	CO2
<b>OR</b>				
2(a)	<b>Explain</b> with sketch the Hoyer's Long line system of pre-tensioning.	5	<b>K2</b> Understanding	CO1
(b)	<b>Explain</b> the difference between Pre-Tensioning and Post Tensioning system.	5	<b>K2</b> Understanding	CO1
(c)	<b>Explain</b> the various types of losses in Post-Tensioning system.	5	<b>K2</b> Understanding	CO2
<b>PART-B</b>				
3(a)	A prestressed concrete beam made of T section has a flange of (1000mmX150mm) and web of (200X800mm). Beam supports super imposed load of 180kN/m over a simply supported over a span of 8m. If the prestressing force in the tendon is 6200kN at mid span and is located at a distance of 500mm from soffit. <b>Determine</b> the resultant stress at midspan for the following case. i) Prestress+Self-weight ii) Prestress+Self-weight+Live load Assume Density of concrete is 24kN/m <sup>3</sup>	10	<b>K3</b> Applying	CO1
(b)	A simply supported pre stressed concrete beam spanning over 10m is of rectangular section 200mm wide and 300mm deep is prestressed with wires area=320mm <sup>2</sup> , locate at a constant eccentricity of 50mm and carrying a initial stress of 1000N/mm <sup>2</sup> . The beam is pretensioned. <b>Determine</b> the loss of stress in wires using the following data. $E_s=210kN/mm^2$ , $E_c=35kN/mm^2$ , Relaxation of steel stress=5% of initial stress, shrinkage of concrete= $300 \times 10^{-6}$ , Creep coefficient=1.6.	5	<b>K3</b> Applying	CO2

OR

4(a)	A prestressed concrete beam of section 200mm wide by 300mm deep is used over a effective span of 6m to support an imposed load of 4kN/m. The density of concrete is 24kN/m <sup>3</sup> . <b>Determine</b> the magnitude of concentric prestressing force necessary for zero fibre stress at the soffit when the beam is fully loaded.	10	K3 Applying	CO1
(b)	A pre stressed concrete beam spanning over 10.5 m is of rectangular section 300X600 is prestressed with wires area=800mm <sup>2</sup> , locat at a constant eccentricity of 100mm and carrying a initial stress of 1050N/mm <sup>2</sup> . The beam is pretensioned. <b>Determine</b> the loss of stress in wires using the following data. $E_s=210\text{kN/mm}^2$ , $E_c=35\text{kN/mm}^2$ , Relaxation of steel stress=2.5% of initial stress, shrinkage of concrete= $300 \times 10^{-6}$ , Creep coefficient=1.6.	5	K3 Applying	CO2

(S)

  
Course Incharge

  
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