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

USN										

Degree : **B.E** — **Semester** : **VIII**
Branch : **Civil Engineering** — **Course Code** : **18CV81**
Course Title : **Design of Pre stressed concrete Elements** — **Date** : 12/04/2024
Duration : **90 Minutes** — **Max Marks** : **30**

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Explain** with sketch the Hoyer's Long line system of Pre-tensioning.	5	K2 Understanding	CO1
(b)	**Explain** the advantages and disadvantages of PSC over RCC.	5	K2 Understanding	CO1
(c)	**Explain** the various types of losses in Post-Tensioning system.	5	K2 Understanding	CO2
	OR			
2(a)	**Explain** the necessity of high strength concrete and high strength steel is used in Pre stress concrete.	5	K2 Understanding	CO1
(b)	**Explain** the difference between Pre-Tensioning and Post Tensioning system.	5	K2 Understanding	CO1
(c)	**Explain** the various types of losses in Pre -Tensioning system.	5	K2 Understanding	CO2
	PART-B			
3(a)	An unsymmetrical I section beam is used to support an imposed load of 2kN/m over a span of 8m.The sectional details are, top flange 300mm wide and 60mm thick, bottom flange of 100mm wide and 60mm thick, thickness of web is 80mm ,overall depth of the beam is 400mm.At the quarter of the span the effective force of 100kN is located at 50mm from the soffit of the beam. **Determine** the stresses at the quarter of span section of the beam at transfer and working condition.	10	K3 Applying	CO1
(b)	A simply supported pre stressed concrete beam spanning over 8m is of rectangular section 300mm wide and 400mm deep is prestressed with wires area=320mm^2, locate at a constant eccentricity of 50mm and carrying a initial stress of 1200N/mm^2.The beam is pretensioned. **Determine** the loss of stress in wires using the following data. E_s=210kN/mm^2,E_c=35kN/mm^2 , Relaxation of steel stress=3% of initial stress, shrinkage of concrete= 200*10^{-6}. Creep coefficient=1.4.	5	K3 Applying	CO2

	OR			
4(a)	The mid span section of a simply supported girder of span 8m is a symmetrical I section 250mmx500mm overall. The flange is 100mm thick and the web is 80mm thick. The girder carries an UDL live load of 10kN/m. **Determine** the intial prestressing force and its eccentricity so that no tension is allowed in concrete both at transfer and service load. Loss of prestress is 18%.	**10**	**K3 Applying**	**CO1**
(b)	A pre stressed concrete beam spanning over 10.5 m is of rectangular section 300X400 is prestressed with wires area=800mm^2, locate at a constant eccentricity of 80 mm and carrying an initial stress of 1200N/mm^2.The beam is pretensioned. **Determine** the loss of stress in wires using the following data. Es=210kN/mm^2, Ec=35kN/mm^2, Relaxation of steel stress=1.5% of initial stress, shrinkage of concrete=200 *10-6,Creep coefficient=1.6.	**5**	**K3 Applying**	**CO2**

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DEPARTMENT OF CIVIL ENGINEERING
SESSION: 2023-2024 (EVEN SEMESTER)
I SESSIONAL TEST QUESTION PAPER
SET-B

USN | | | | | | | | | | |

Degree	:	B.E	Semester :	VIII
Branch	:	Civil Engineering	Course Code :	18CV81
Course Title	:	Design of Pre stressed concrete Elements	Date :	12/04/2024
Duration	:	90 Minutes	Max Marks :	30

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Explain** the necessity of high strength concrete and high strength steel is used in Pre stress concrete.	5	K2 Understanding	CO1
(b)	**Explain** the advantages of PSC over RCC.	5	K2 Understanding	CO1
(c)	**Explain** the various types of losses in Pre-Tensioning system.	5	K2 Understanding	CO2
	OR			
2(a)	**Explain** with sketch the Hoyer's Long line system of pre-tensioning.	5	K2 Understanding	CO1
(b)	**Explain** the difference between Pre-Tensioning and Post Tensioning system.	5	K2 Understanding	CO1
(c)	**Explain** the various types of losses in Post-Tensioning system.	5	K2 Understanding	CO2
	PART-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. **Determine** 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^3	10	K3 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^2, locate at a constant eccentricity of 50mm and carrying a initial stress of 1000N/mm^2.The beam is pretensioned. **Determine** the loss of stress in wires using the following data. Es=210kN/mm^2,Ec=35kN/mm^2 , Relaxation of steel stress=5% of initialstress, shrinkage of concrete=300*10^{-6}, Creep coefficient=1.6.	5	K3 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^3.**Determine** 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^2,locat at a constant eccentricity of 100mm and carrying a initial stress of 1050N/mm^2.The beam is pretensioned. **Determine** the loss of stress in wires using the following data. E_s=210kN/mm^2, E_c=35kN/mm^2, Relaxation of steel stress=2.5% of initial stress, shrinkage of concrete=300*10-6, Creep coefficient=1.6.	**5**	**K3 Applying**	**CO2**

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DEPARTMENT OF CIVIL ENGINEERING
SESSION: 2023-2024 (EVEN SEMESTER)
II SESSIONAL TEST QUESTION PAPER
SET-A

USN | | | | | | | | | |

Degree	:	**B.E**	**Semester**	:	**VIII**
Branch	:	**Civil Engineering**	**Course Code**	:	**18CV81**
Course Title	:	**Design of Pre stressed concrete Elements**	**Date**	:	06/05/2024
Duration	:	**90 Minutes**	**Max Marks**	:	**30**

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Explain** the different types of flexural failures of PSC beams.	5	K2 Understanding	CO2
(b)	A post-tensioned bonded pre stressed concrete beam of T section has a flange width of 1500mm and thickness of flange is 200mm. The thickness of rib is 300mm.The area of high tensile steel is 5000mm^2, located at an effective depth of 1800mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of T section.	10	K3 Applying	CO3
	OR			
2(a)	**Explain** the IS code method of determining the ultimate moment of resistance of rectangular and flanged section PSC members.	5	K2 Understanding	CO2
(b)	A Pre-Tensioned PSC beam of I section with 160mmx70mm flanges with thickness of web 50mm and overall depth is 320mm. The beam is pre stressed with 4-HTS wires of 7mm diameter at an effective depth of 265mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of I section.	10	K3 Applying	CO3
	PART-B			
3(a)	**Explain** the modes of shear failure.	5	K3 Applying	CO2
3(b)	The support section of pre stressed concrete beam of rectangular section 120mm x250mm,supports a super imposed load of 15kN/m excluding the self-weight spanning over 10m. The cable is parabolic with maximum eccentricity of 75mm at center of span and zero at supports. **Design** the shear reinforcement using IS-code recommendations for the following data. The	10	K3 Applying	CO3

	pre stressing force is 150 kN , f_{ck}= 40 N/mm^2 ,Density of concrete is 24 kN/mm^3 and f_y is 415N/mm^2.			
	OR			
4(a)	**Explain** the ways of improving the shear resistance of structural concrete members by pre stressing technique	5	K3 Applying	CO2
(b)	The support section of PSC beam (150mmx300mm) is to resist a shear of 100kN. The pre stress at centroidal axis is 5 N/mm^2, f_{ck}= 40 N/mm^2.The cover to the tension reinforcement is 45mm. Check the section for shear and **Design** suitable shear reinforcement ft=1.5 N/mm^2	10	K3 Applying	CO3

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DEPARTMENT OF CIVIL ENGINEERING
SESSION: 2023-2024 (EVEN SEMESTER)
II SESSIONAL TEST QUESTION PAPER
SET-B

USN | | | | | | | | | | |

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

Semester : VIII
Course Code : 18CV81
Date : 06/05/2024
Max Marks : 30

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Explain** the IS code method of determining the ultimate moment of resistance of rectangular and flanged section PSC members.	5	K2 Understanding	CO2
(b)	A post-tensioned bonded pre stressed concrete beam of T section has a flange width of 1400mm and thickness of flange is 200mm. The thickness of rib is 300mm.The area of high tensile steel is 8000mm^2, located at an effective depth of 1800mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of T section.	10	K3 Applying	CO3
	OR			
2(a)	**Explain** the different types of flexural failures of PSC beam.	5	K2 Understanding	CO2
2(b)	A Pre-Tensioned PSC beam of I section with 160mmx70mm flanges with thickness of web 70mm and overall depth is 650mm. The beam is pre stressed with 4-HTS wires of 7mm diameter at an effective depth of 265mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of I section.	10	K3 Applying	CO3
	PART-B			
3(a)	**Explain** the ways of improving the shear resistance of Structural concrete members by pre stressing technique.	5	K3 Applying	CO2
(b)	The support section of pre stressed concrete beam of rectangular section 230mm x500mm,supports a super imposed load of 10kN/m excluding the self-weight spanning over 10m. The cable is parabolic with maximum eccentricity of 75mm at center of span and zero at supports. **Design** the shear reinforcement using	10	K3 Applying	CO3

	IS-code recommendations for the following data. The pre stressing force is 150 kN , f_{ck}= 40 N/mm^2 ,Density of concrete is 24 kN/mm^3 and f_y is 415N/mm^2.			
	OR			
4(a)	**Explain** the modes of shear failure.	**5**	**K3 Applying**	**CO2**
(b)	The support section of PSC beam (150mmx300mm) is to resist a shear of 150kN. The pre stress at centroidal axis is 5 N/mm^2, f_{ck}= 40 N/mm^2.The cover to the tension reinforcement is 45mm. Check the section for shear and **Design** suitable shear reinforcement ft=1.5 N/mm^2	**10**	**K3 Applying**	**CO3**

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DEPARTMENT OF CIVIL ENGINEERING

SESSION: 2023-2024 (EVEN SEMESTER)

III SESSIONAL TEST QUESTION PAPER

SET-A

USN | | | | | | | | | | |

Degree	:	B.E	Semester	:	VIII
Branch	:	Civil Engineering	Course Code	:	18CV81
Course Title	:	Design of Pre stressed concrete Elements	Date	:	06/05/2024
Duration	:	90 Minutes	Max Marks	:	30

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	A post-tensioned bonded pre stressed concrete beam of T section has a flange width of 1500mm and thickness of flange is 200mm. The thickness of rib is 300mm.The area of high tensile steel is 5000mm^2, located at an effective depth of 1800mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of T section.	10	K3 Applying	CO4
(b)	**Explain** end Zone reinforcement.	5	K2 Understanding	CO5
	OR			
2(a)	A Pre-Tensioned PSC beam of I section with 160mmx70mm flanges with thickness of web 50mm and overall depth is 320mm. The beam is pre stressed with 4-HTS wires of 7mm diameter at an effective depth of 265mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of I section.	10	K3 Applying	CO4
(b)	**Explain** anchorage zone of stress	5	K2 Understanding	CO5
	PART-B			
3(a)	The support section of pre stressed concrete beam of rectangular section 120mm x250mm,supports a super imposed load of 15kN/m excluding the self-weight spanning over 10m. The cable is parabolic with maximum eccentricity of 75mm at center of span and zero at supports. **Design** the shear reinforcement using IS-code recommendations for the following data. The pre stressing force is 150 kN , f_{ck}= 40 N/mm^2 ,Density of concrete is 24 kN/m^3 and f_y is 415N/mm^2.	10	K3 Applying	CO4
3(b)	**Explain** the differentiate between web shear and flexural shear cracks in PSC member with neat sketches.	5	K2 Understanding	CO5

	OR			
4(a)	The support section of PSC beam (150mmx300mm) is to resist a shear of 100kN. The pre stress at centroidal axis is 5 N/mm^2, f_{ck}= 40 N/mm^2. The cover to the tension reinforcement is 45mm. Check the section for shear and Design suitable shear reinforcement ft=1.5 N/mm^2.	**10**	**K3 Applying**	**CO4**
(b)	**Explain** the various losses in pre-tensioning and post-tensioning system.	**5**	**K2 Understanding**	**CO5**

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III SESSIONAL TEST QUESTION PAPER
SET-B

USN | | | | | | | | | | |

Degree	:	B.E	Semester :	VIII
Branch	:	Civil Engineering	Course Code :	18CV81
Course Title	:	Design of Pre stressed concrete Elements	Date :	15/5/2024
Duration	:	90 Minutes	Max Marks :	30

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	A post-tensioned bonded pre stressed concrete beam of T section has a flange width of 1200mm and thickness of flange is 200mm. The thickness of rib is 300mm.The area of high tensile steel is 6000mm^2, located at an effective depth of 1600mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of T section.	10	K3 Applying	CO4
(b)	**Explain** the differentiate between web shear and flexural shear cracks in PSC member with neat sketches.	5	K2 Understanding	CO5
	OR			
2(a)	A Pre-Tensioned PSC beam of I section with 160mmx70mm flanges with thickness of web 50mm and overall depth is 350mm. The beam is pre stressed with 4-HTS wires of 7mm diameter at an effective depth of 265mm. If the characteristics strength of concrete and steel are 40 N/mm^2, 1600 N/mm^2 respectively. **Determine** the flexural strength of I section.	10	K3 Applying	CO4
(b)	**Explain** the various losses in pre-tensioning and post-tensioning system.	5	K2 Understanding	CO5
	PART-B			
3(a)	The support section of pre stressed concrete beam of rectangular section 130mm x250mm,supports a super imposed load of 15kN/m excluding the self-weight spanning over 10m. The cable is parabolic with maximum eccentricity of 75mm at center of span and zero at supports. **Design** the shear reinforcement using IS-code recommendations for the following data. The pre stressing force is 150 kN , f_{ck}= 40 N/mm^2 ,Density of concrete is 24 kN/mm^3 and f_y is 415N/mm^2.	10	K3 Applying	CO4
3(b)	**Explain** end Zone reinforcement.	5	K2 Understanding	CO5

	OR			
4(a)	The support section of PSC beam (150mmx300mm) is to resist a shear of 100kN. The pre stress at centroidal axis is 5 N/mm^2, f_{ck}= 40 N/mm^2.The cover to the tension reinforcement is 45mm. Check the section for shear and Design suitable shear reinforcement ft=1.5 N/mm^2	**10**	**K3 Applying**	**CO4**
(b)	**Explain** anchorage zone of stress	**5**	**K2 Understanding**	**CO5**

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K.S SCHOOL OF ENGINEERING AND MANAGEMENT

Dept. of Civil Engineering KSSEM

BLUE BOOK

Name of the Student: Nida Manzoor Jeli

Class / Sem : 8th **Branch:** civil

USN : 1 K G 2 0 C V 0 0 5

SUBJECT : Design of Pre-stressed concrete elements **Subject Code :** 18CV81

MAXIMUM MARKS :

Test	I	II	III	Average Marks Obtained
Date	12-4-24	6-5-24	13-5-24	(30/30) +10 = 40/40
Marks Obtained	30	30	30	
Signature of the Student	Nida	Nida	Nida	Nida
Initials of Room Supervisor				
Initials of Faculty				

NAME OF FACULTY : Dr. Nanda M

SIGNATURE :

SIGNATURE OF H.O.D.

K S SCHOOL OF ENGINEERING AND MANAGEMENT

First Internal test

Q. No	Marks	CO	Q. No	Marks	CO	CO	Total
1(a)	10	1	3(a)			1	20
1(b)	5	2	3(b)				
1(c)			3(c)			2	10
OR			OR				
2(a)			4(a)	10	1		
2(b)			4(b)	5	2		
2(c)			4(c)			**Grand Total**	30

Second Internal test

Q. No	Marks	CO	Q. No	Marks	CO	CO	Total
1(a)	10	3	3(a)			2	10
1(b)	5	2	3(b)				
1(c)			3(c)			3	20
OR			OR				
2(a)			4(a)	10	3		
2(b)			4(b)	5	2		
2(c)			4(c)			**Grand Total**	30

Third Internal test

Q. No	Marks	CO	Q. No	Marks	CO	CO	Total
1(a)	10	4	3(a)			4	20
1(b)	5	5	3(b)				
1(c)			3(c)			5	10
OR			OR				
2(a)			4(a)	10	4		
2(b)			4(b)	5	5		
2(c)			4(c)			**Grand Total**	30

Signature of the Staff