AIKTC/KRRC/SoET/ACKN/QUES/2021-22/ **Date:** 02/08/2022

School: SoET-CBCS **Branch:** CIVIL ENGG. **SEM:** VIII

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following **Semester/Unit Test-I/Unit Test-II (Reg./ATKT)** question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Design and Drawing of Reinforced Concrete Structures	CE-C801		✓	
2	Construction Management	CE-C802		✓	
3	Department Level Optional Course – IV IWT	CE-C803		✓	
4	Institute Level Optional Course – II Environmental mgmt.	CE-E804		✓	
5	DLO – Bridge engg. & Design			✓	

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

Civil
17/5/2022
sem-VIII

University of Mumbai

Examination:First Half 2022(May-June 2022)

Program: **Civil Engineering**
Curriculum Scheme: **R2016 (CBCS)**
Examination: **BE**Semester: **VIII**
Course Code: **CEC801** Course Name: **Design & Drawing of Reinforced Concrete Structures**
Time: **2 Hours 30 minutes**Max. Marks: **80**

N. B. 1) Question No. 1 is compulsory.
2) Attempt any one sub question from question No. 2 and 3.
3) Attempt any two sub questions from question No. 4.
4) Use of relevant IS 456: 2000 and IS 3370: 2009 Code is permitted.
5) Assume suitable data if required and state it clearly

Q1.	**Choose the correct option for the following questions. All the Questions are compulsory and each question carriestwo marks. 20 marks**
1.	If thickness of slab is 170 mm, then its dead load is
Option A:	4500 N/m²
Option B:	4250 N/m²
Option C:	4100 N/m²
Option D:	4850 N/m²
2.	In case of singly reinforced beam if xu / d is equal to the limiting value Xu max / d then the section is
Option A:	Over reinforced section
Option B:	Under reinforced section
Option C:	Balanced section
Option D:	Neutral section
3.	The vertical distance between the horizontal surfaces of two consecutive stair steps is called
Option A:	Rise
Option B:	Nosing
Option C:	waist slab
Option D:	winder
4.	If number of risers used in stair case are 12 in each flight, then number of treads in each flight are equal to
Option A:	13
Option B:	09
Option C:	10
Option D:	11
5.	Toe slab is a part of
Option A:	Retaining wall
Option B:	Water tank
Option C:	Stair case
Option D:	Flat slab
6.	What is the area of vertical distribution steel of a circular tank by IS code method if thickness of wall is 170 mm.

1/3

Option A:	763 mm²
Option B:	620 mm²
Option C:	510 mm²
Option D:	850 mm²
7.	A method of prestressing concrete in which the tendons are tensioned before the concrete is placed is called
Option A:	Posttensioning
Option B:	Tendon
Option C:	Debonding
Option D:	Pretensioning
8.	Loss of stress due to friction depends upon
Option A:	Coefficient of friction
Option B:	Modulus of elasticity of concrete
Option C:	Relaxation of steel
Option D:	Anchorage slip
9.	Lap splices shall not be provided at
Option A:	At mid span
Option B:	With in a joint
Option C:	Long span
Option D:	With in a distance of 5d from the face of joint
10.	Now india is divided into ------ seismic zones.
Option A:	5
Option B:	3
Option C:	4
Option D:	6

Q. 2	Solve ***any one Question*** out of the two.	**20 marks**
A	Design a 4.5 m x 6.5 m interior panel of a two-way continuous slab for a live load of 3000 N/m². Use M20 concrete and Fe415 steel.	
B	Design a reinforced concrete cantilever type retaining wall having a 5 m tall stem. The wall retains soil level with its top. The soil weighs 18000 N/m³ and has angle of repose of 30°.The safe bearing capacity of soil is 200 KN/m². Coefficient of friction between soil and concrete is 0.55. Use M20 concrete and Fe415 steel. Draw the reinforcement details.	

Q. 3	Solve *any One Question* out of the two. **20 marks**
A	Design a dog legged staircase for floor-to-floor height of 3.1 m subjected to live load of 3 KN/m² and floor finish of 1 KN/m². Available room size is 3.5 m x 5 m. Draw reinforcement details for both the flights. Use M20 grade of concrete and Fe415 steel.
B	Design a circular water tank of capacity 2500000 liter if the depth of water in the tank be limited to 3 m with 0.25 m free board. The joint of the wall and base slab is rigid. Use IS code method to design the walls. Sketch the reinforcement details.

Q. 4	Solve *any Two Question* out of the three. **20 marks**
A	A prestress concrete beam 200 mm wide and 300 mm deep is prestressed with wires (area = 320 mm²) located at a constant eccentricity of 50 mm and carrying an initial stress of 1000 N/mm². The span of the beam is 10 m. Calculate the percentage loss of stress in wires if i) if the beam is pretensioned and ii) the beam is post-tensioned, using the following data. Es = 210 KN / mm², Ec = 35 KN / mm², Relaxation of steel stress = 5 percent of initial stress, shrinkage of concrete = 300 x 10^{-6} for pretensioning and 200 x 10^{-6} for post tensioning, creep coefficient = 1.6, slip at anchorage = 1 mm, frictional coefficient for wave effect = 0.0015 per m.
B	What is the importance of ductile design and detailing in earthquake resisting structures? Discuss in detail.
C	What are the different systems of pre-tensioning in prestress concrete. Explain anyone system.

20/05/2022 – Morning

CE

University of Mumbai

Examination First Half 2022 under cluster __ (Lead College: ( )

Examinations Commencing from 17th May 2022 to 30th May 2022

Program: **CIVIL ENGINEERING**

Curriculum Scheme: Rev2016

Examination: BE Semester VIII

Course Code: CE-C802 and Course Name: Construction Management

Time: 2-hour 30 minutes Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (2 Marks each)**
1.	The feasibility study is carried out in which phase of project life cycle?
Option A:	Initiation
Option B:	Planning
Option C:	Organizing
Option D:	Clean up
2.	Whichmanagement functioninvolves settinggoals &objectivesandcreatingspecificplans forcompleting them?
Option A:	Planning
Option B:	Organizing
Option C:	Controlling
Option D:	Leading
3.	The shortest possible time in which an activity can be achieved under ideal circumstances is known as _____
Option A:	Most likely time
Option B:	Optimistic time
Option C:	Expected time
Option D:	Pessimistic time
4.	Which activity is having positive float value?
Option A:	Super Critical Activity
Option B:	Special Activity
Option C:	Sub Critical Activity
Option D:	Critical Activity
5.	The difference betweenthe maximum timeavailableandtheactual timeneededtoperforman activityisknownas __
Option A:	Free float
Option B:	Independentfloat
Option C:	Totalfloat
Option D:	Half float
6.	Cost slope is defined as..... _____
Option A:	Cost required to complete the activity in minimum time
Option B:	Cost required for the activity
Option C:	Time required to crash the activity
Option D:	Cost required to crash the activity by unit time

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CE

7.	Findoutcriticalpath Activity / Succeeding Activity / Time A / B,C / 12 B / D / 13 C / D / 14 D / – / 15
Option A:	A-B-D
Option B:	A-C-D
Option C:	A-B-C-D
Option D:	B-C-D
8.	While crashing a network, which activity having following characteristic is to be crashed first?
Option A:	Critical activity with maximum cost slope
Option B:	Non - Critical Activity with minimum cost slope
Option C:	Non- Critical activity with Maximum cost slope
Option D:	Critical activity with minimum cost slope
9.	Which of the following costs is not direct cost of the Project?
Option A:	Material Cost
Option B:	Office Expenses
Option C:	Labor wages
Option D:	Hiring Charges of Machines
10.	Ensuring the safety, health and welfare of the employees is the primary purpose of which labour Act?
Option A:	Payment of wages Act,
Option B:	Minimum Wages Act
Option C:	Factories Act
Option D:	Industrial disputes Act

Q2 (20Marks)	**Solve any Two Questions out of Three (10 marks each)**
A	Following data is associated with a small Project. Draw Project Network. Identify Critical path & compute Project duration. Calculate Event times, Activity Times & all types of floats associated with activities

Activity	M	N	P	Q	R	S	T	V	W	X
Preceding Activity	-	-	M	N	P	N	S	P	Q, T	R, W
Duration (days)	7	5	10	5	8	6	5	4	10	5

B	What is Life Cycle of Project? Explain all the phases involved in it.
C	What is Site Layout? Explain the factors affecting the preparation of Site Layout

CE

Q3 (20 Marks) — **Solve any Two Questions out of Three (10 marks each)**

A. Find out Optimum cost & Optimum duration for the following project data.
Indirect Cost of Project = Rs 2000/ day

Activity	Duration (days)		Cost (Rs)	
	Normal	Crash	Normal	Crash
P (1-2)	9	6	8000	9500
Q (1-3)	5	3	5000	7500
R (3-5)	7	4	10000	14000
S (2-4)	6	4	4000	6000
T (2-5)	5	3	4500	7000
U (4-5)	9	5	5000	9000
V (5-6)	4	2	3000	5500

B. What is an updating of Project? Explain stepwise procedure of updating of a network.

C. Explain Gantt bar chart in detail with an example along with its limitations

Q4 (20 Marks) — **Solve any Two Questions out of Three (10 marks each)**

A. A small Project consist of nine activities & time estimates are given below.

a) Draw Project Network
b) Find expected duration, Standard deviation & variance of all activities
c) Find out duration of project corresponding to 85 % probability
d) What is the probability of completing the project in 22 days?

Activity	Optimistic Time (to)	Most Likely Time (tm)	PessimisticTime (tp)
A (1-2)	2	4	6
B (1-6)	4	8	12
C (2-3)	3	6	9
D (2-4)	3	5	7
E (3-5)	5	7	9
F (4-5)	3	6	9
G (6-7)	2	4	6
H (5-8)	5	7	9
I (7-8)	3	5	7

Z	-3.0	-2.0	-1.0	0	+1.0	+2.0	+3.0
P (%)	0.13	2.28	15.87	50	84.13	97.72	99.87

B. What is Resource allocation? Explain in detail the methods of Resource allocation

C. Explain: - 1) Role of inspection in Quality Control 2) Workmen Compensation Act

Q Pcode: 93963

University of Mumbai

Examinations Summer 2022

Program: **Civil Engineering**

Curriculum Scheme: Rev - 2016

Examination: BE Semester VIII

26/05/2022

Subject (Paper Code): 52654 and Course Name: Industrial Waste Treatment

Time: 2hour 30 minutes Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Equalization consist of holding the wastewater for some predefined time in a continuously mixed basin, to produce a .....
Option A:	Uniform wastewater
Option B:	Alkaline Wastewater
Option C:	Acidic Wastewater
Option D:	Chemical Wastewater
2.	Which of the following improves the safety in an industry?
Option A:	Good house keeping
Option B:	reduced noise level
Option C:	material handling system
Option D:	reduced air pollution level
3.	DO concentration may fall to zero, causing anaerobic conditions in the river reach, called
Option A:	Zone of degradation
Option B:	Zone of active decomposition
Option C:	Zone of recovery
Option D:	Zone of clear water
4.	As per effluent standards, for disposal into the ocean pH value of treated effluent shall be
Option A:	0-4
Option B:	4 to 6
Option C:	7
Option D:	5.5 to 9.0
5.	The study which gives whether a wastewater /effluent is subject to a physical, chemical, biological, or thermal treatment process is known as:
Option A:	Treatment Study
Option B:	Treatability Study
Option C:	Bioassay Study
Option D:	Water Quality study
6.	EIA is abbreviated form for
Option A:	Energy Impact Assessment
Option B:	Ecological Impact Assessment
Option C:	Environmental Impact Assessment
Option D:	Emission Impact Assessment

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7.	Reclamation water from sewage is being practiced using _____ treatment methods in many countries.
Option A:	Preliminary
Option B:	Tertiary
Option C:	Primary
Option D:	secondary
8.	Because of high nutrient content of spentwash, _____ recovery is possible.
Option A:	Potash
Option B:	Phosphorus
Option C:	Nitrogen
Option D:	Ammonia
9.	In unit operations
Option A:	Physical forces are employed
Option B:	Chemical forces are employed
Option C:	Biological forces are employed
Option D:	Electrical forces are employed
10.	.....is the byproduct of dairy industry
Option A:	Bagasse
Option B:	Casein
Option C:	Pressmud
Option D:	Dye

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Explain with the help of flow-sheet the manufacturing process of sugar from sugar cane
B	Discuss with the help of manufacturing flow sheet the process that contributes to industrial wastes in tannery industry. Give the major characteristics of the wastes.
C	Explain CETP with flow diagram and give its advantages and limitations

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	A city discharges 100 cumecs of sewage in to a river, which is fully saturated with oxygen and flowing at a rate of 1500 cumecs during its lean days with a velocity of 0.1m/sec. The 5-day BOD of sewage at a given temperature is 250 mg/lit. Find out when & where the critical DO deficit will occur in the downstream portion of the river & what is its amount. Assume coefficient of purification of stream (f) as 4 & coefficient of de-oxygenation (KD) as 0.1.
B	Explain the following points related to dairy industry I) Flow sheet of manufacturing process and waste water generation II) Characteristics of waste water III) Flow sheet of waste water treatment

C	Why Neutralization is required for the Industrial waste? Explain the various methods of neutralization.

Q4	Solve any Four out of Six	5 marks each
A	Write a short note on Equalization	
B	Write a short note on strength reduction	
C	Write a short note on EIA	
D	Explain stream and effluent standards	
E	Factors to be considered while selecting a material for construction of sewers	
F	Write short note on methods of sampling	

Branch: CE|CO|ME|EE

Q.P. Code : 00093764

30/05/2022

Sub: EM

Sem.: VIII

University of Mumbai

Examinations Summer 2022
Program: IT01028
Curriculum Scheme: Rev2016
Examination: BE Semester VIII
Course Code: 52965 and Course Name: Environmental Management

Time: 2 hour 30 minutes **Max. Marks: 80**

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The Bhopal gas Tragedy in 1984 is related to--
Option A:	Nuclear disaster
Option B:	Earthquake disaster
Option C:	Man-made disaster
Option D:	Floods
2.	The government of India enacted EPA of 1986 under article___ of the constitution
Option A:	253
Option B:	251
Option C:	249
Option D:	51A
3.	The primary agenda of the Kyoto protocol is:
Option A:	Regulation of hazardous wastes
Option B:	Regulate the production of nuclear energy
Option C:	Control anthropogenic sources of greenhouse gases
Option D:	Control of the worldwide Energy consumption
4.	Which of the following is a prime health risks associated with greater UV radiation through the atmosphere due to depletion of ozone layer?
Option A:	Damage to digestive system
Option B:	Increased liver cancer
Option C:	Increased skin cancer

Option D:	Neurological disorder
5.	P-D-C-A stands for:
Option A:	Plan-Do-Check-Act
Option B:	Plan-Do-Correct-Act
Option C:	Proceed-Do-Check-Act
Option D:	Proceed-Do-Correct-Act
6.	The combination of all factors that act to limit the growth of a population is:
Option A:	Carrying capacity
Option B:	Environmental resistance
Option C:	Biotic potential
Option D:	Logistic growth
7.	In acid rain PH of water is:
Option A:	Less than 5.6
Option B:	Around 7
Option C:	More than 7
Option D:	around 14
8.	Environment Impact assessment (EIA) is done
Option A:	Before the project
Option B:	After the project
Option C:	During the project
Option D:	Any time in life cycle of project
9.	Energy conversation act was formed in year
Option A:	1997
Option B:	2000

Option C:	2001
Option D:	1999
10.	The Minamata Disease was caused due to:
Option A:	Methyl Isocyanate
Option B:	Mercury
Option C:	Benzene
Option D:	Lead

Q.2 (A)	**Solve any two of the following:** **(10M)**
i)	*What are the aspects of Environment Management & challenges faced in it?*
ii)	*Write a note on loss of Bio-diversity.*
iii)	*Discuss the EMS certification.*
(B)	**Solve any one of the following:** **(10M)**
i)	Discuss the Environmental issues relevant to India.
ii)	Write a note on the role of government as a planning & regulating agency.

Q3 (A)	**Solve any two of the following:** **(10M)**
i)	*Define: Limiting factors & Carrying capacity. Discuss their relation with the environment.*
ii)	*What are the features of Environment Protection Act,1986.*
iii)	Discuss the role of Central Pollution Control Board (CPCB) in pollution monitoring.
(B)	**Solve any one of the following:** **(10M)**
i)	*What is ISO-14000? How does adoption of ISO-14000 practices benefit the Industries as well as the Environment?*
ii)	*What is Hazardous Waste? Note the different health risk caused by it. How does it affect the environment?*

Q4. (A)	**Solve any two of the following:** **(10M)**
i.	*Write a note on the Water(Prevention& control of Pollution)Act.*
ii.	*Define Ecosystem. What are the components of Ecosystem?*
iii.	Differentiate between: Industrial Disasters & Man-made disasters
B	**Solve any One** **(10M)**
i.	*What is sustainable development? Is sustainable development necessary? What are the parameters affecting it?*
ii.	*Write a note on; Total Quality Environmental Management & Corporate Environment Responsibility.*

QP Code : 93799

26/05/2022

University of Mumbai

Examination Summer 2022

Program: Civil Engineering

Curriculum Scheme: Rev2019 16

Examination: BE Semester: VIII

Course Code: CE-DLO8034 and Course Name: Bridge Engineering and Design

Time: 2-hour 30 minutes Max. Marks: 80

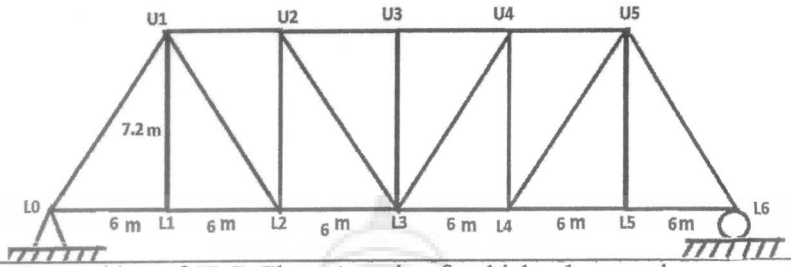
Note: IRC 6-2017, IRC 112-2011 and IS 1343-2012 are permitted in examination.

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks.** **(2 x 10)**
1.	Which of the following theories is not suitable for load analysis on a longitudinal girder of a bridge?
Option A:	Wester guard's theory
Option B:	Grid slab theory
Option C:	Henery Jaeger theory
Option D:	Courbon's theory
2.	A tilt of ….. and a shift of …. shall be considered in the design of well foundation.
Option A:	1 in 150, 80 mm
Option B:	1 in 100, 100 mm
Option C:	1 in 80, 150 mm
Option D:	1 in 10, 10 mm
3.	Micro piles are most suitable for which loads?
Option A:	both tension and compression
Option B:	tension only
Option C:	compression only
Option D:	tension, compression and lateral
4.	In case of multi-lane bridges, each ……. loading shall be considered to occupy two lanes and no other vehicle shall be allowed in these two lanes.
Option A:	IRC Class 70R or IRC Class B
Option B:	IRC 70R or IRC Class AA
Option C:	IRC Class A
Option D:	IRC Class B
5.	The span length of bridge for which the cost of the superstructure is equal to cost of substructure is called ……
Option A:	Effective span
Option B:	Economical span
Option C:	True span
Option D:	Clear span
6.	The balanced cantilever method of construction of bridge is easily adaptable to …
Option A:	irregular and long span lengths
Option B:	regular and long span lengths
Option C:	irregular and medium span lengths
Option D:	regular and medium span lengths
7.	Which of the following is incorrect?
Option A:	Poisson's ratio for concrete used in bridges is considered as 0.2.
Option B:	Service life of normal bridge, designed in India shall be 100 years.

Option C:	Minimum clear distance between outer of wheels of two passing or crossing IRC Class A vehicles must be 1.2 m for bridge of carriageway width 6.1 m and more.
Option D:	From durability requirements, minimum clear cover to the reinforcement bars must be 50 mm when bridge is constructed at a place having sever environmental conditions of exposure.
8.	What will be intensity of live load per m width of RC deck slab bridge, accounting effect of Impact Factor, if effective span of bridge is 6 m and dispersion of load due to IRC Class 70R tracked vehicle is on a patch of 5.55 m (along the span) x 7.45 m (along the carriageway width)?
Option A:	16.93 kN/m
Option B:	20.53 kN/m
Option C:	33.3 kN/m
Option D:	45.76 kN/m
9.	Which of the following statements about IRC Class B train of vehicles are incorrect? 1. Total load of vehicle is 332 kN. 2. Maximum load transferred by an axle is 114 kN. 3. Distance between front most and rear most axle of a vehicle is 18.8 m. 4. Distance between tail of leading vehicle and nose of succeeding vehicle shall not be less than 30 m. 5. There are in all 7 axles in a vehicle.
Option A:	2, 4 & 5
Option B:	1 & 3
Option C:	3 & 4
Option D:	2 & 5
10.	A 50 m long lattice girder bridge has to carry Modified Broad Gauge -1987 Loading. Coefficient of dynamic augment shall be ….
Option A:	0.293
Option B:	0.445
Option C:	0.111
Option D:	0.701
Q2.	**Attempt any Four out of Six.** **(5 x 4)**
A	What is a well foundation? What are various shapes of well foundations? Also sketch components of well foundation.
B	Enlist the various method of launching of a girder. Explain any one in detail.
C	How the bridges are classified on the basis of load transfer mechanism, material, lanes and flood level?
D	A PSC girder bridge has 200 mm thick RC interior slab panel. The ultimate bending moment acting per meter width of slab along shorter span is 30.5 kN-m. Verify the depth of slab in flexure and design reinforcement. Use 12 mm ϕ-Fe 415 bars and M30 concrete.
E	What are different factors influences to decide the span of a bridge? What do you mean by economical span of a bridge? Develop equation for the same.
F	Determine bending moment on a longitudinal girder of 30 m span bridge due to IRC Class AA tracked vehicle. Clear carriage width is 7.5 m. Consider longitudinal girders at 2.5 m c/c and cross girders at 4.5 m c/c.
Q3.	**Attempt any Two Questions out of Three.** **(10 x 2)**
A	Calculate the LLBM for the RCC slab culvert for the National highway to suit the following requirements: • Carriageway: 7.5 m • Footpath: 1 m on either side • Effective span: 6 m • Live load: IRC class A wheeled vehicle • Wearing coat: 80 mm thick and deck slab: 500 mm thick

B Determine the force in the member U_2L_3 of lattice girder bridge due to total imposed load acting per track as under. Consider CDA = $[0.15 + \frac{8}{6+L}]$

Span (m)	12	13	14	15	16	17	18
Total load (kN)	1377	1475	1558	1631	1695	1751	1820

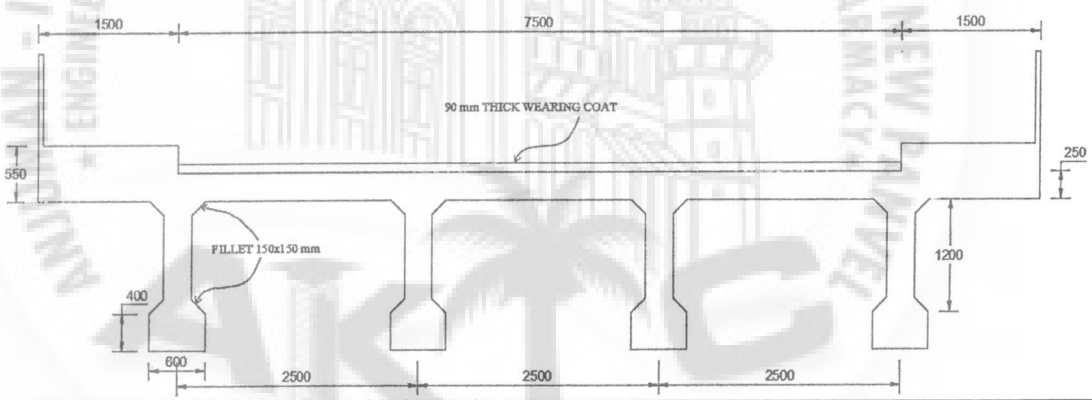


C Locate the position of IRC Class A train of vehicle along and across a 13 m long and 8 m wide carriageway deck slab bridge to produce maximum flexural effect in it.

Q4 A **Attempt any One Question out of Two.** **(10 x 2)**

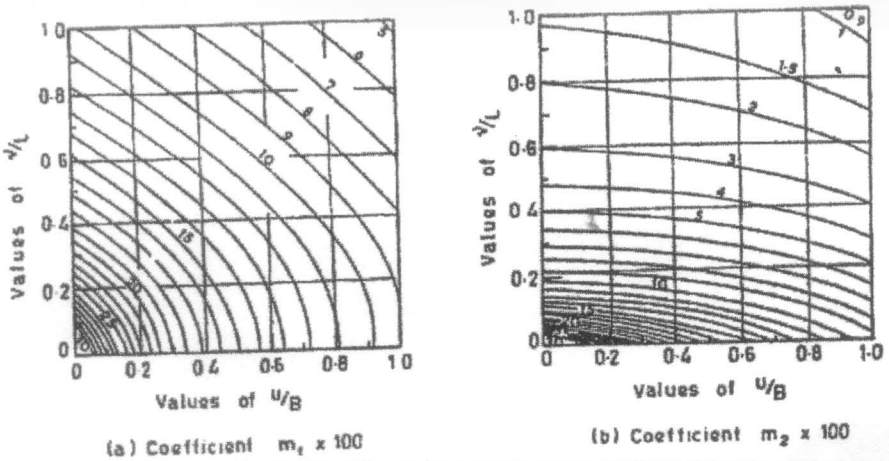
I A simply supported prestressed concrete deck slab bridge has to carry LLBM and DLBM of 170 kN-m and 300 kN-m respectively per meter width of carriage way. Take thickness of wearing coat 100 mm and deck slab 500 mm. Check suitability of section in limit state of serviceability cracking and maximum compression. Also determine prestressing force and eccentricity at mid span. Use M60 concrete and steel with f_p 1700 MPa. Consider $f_{ci} = f_{ck}$, losses 20% and type-1 element.

II Determine bending moment on a longitudinal girder of 27 m span due to self-weight of bridge superstructure. Cross girders are provided at 4.5 m c/c. Area of cross girder is 70% of area of longitudinal girder.



B **Attempt any Two Questions out of Three.** **(5 x 2)**

I Calculate BM in an interior slab panel of a girder bridge due to IRC Class AA tracked vehicle. Longitudinal girders and cross girders are provided at 2.5 m c/c and 5 m c/c respectively. Thickness of RCC slab is 250 mm and thickness of wearing coat is 100 mm.



II	How environmental exposer conditions for a bridge construction be identified? How does it effect on the following? Grade of concrete, Nominal cover, Maximum water cement ratio, Minimum cement content per meter cube of concrete
III	What is different between fixed and expansion type of bearing? Explain components and functioning of elastomeric bearing.

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