

AIKTC/KRRC/SoET/ACKN/QUES/2018-19/

Date: _____

School: SoET-CBSGS

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		✓	02
2	Construction Engineering	CE-C802		✓	02
3	Construction Management	CE-C803		✓	02
4	Elective II Industrial waste treatment	CE-E804		✓	02
5	Bridge design engineering			✓	02
6					

Note: SC - Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

(129)

8/5/9

Q.P.Code: 37772

(4 Hours)

[Total Marks: 80]

1. Question No 1 is **Compulsory**.
2. Attempt any **three** questions out of remaining questions.
3. Use of **IS CODES** is **permitted**.
4. **Assume** suitable data if required and **state** it clearly.
5. All sketches must be drawn on **drawing sheet**.

Q 1

Attempt following questions

- a. Explain the conditions for which an underground water tank is designed. 05
- b. Explain the detailing in RCC structures with suitable examples 05
- c. Why cover is provided for reinforcement in RCC structures. Write the values of cover provided for reinforcement provided in slab, beam, column, foundation and water tank. 05
- d. Explain with neat sketch structural behavior of cantilever and counter fort retaining wall. 05

Q 2

The framing plan of a school building is shown in Figure 1. Take live load as 4 kN/m^2 and floor finish load equal to 1.5 kN/m^2 . All external walls are 230 mm thick and internal walls are 150 mm thick. Floor to floor height is 3.5 m. Grade of concrete is M 20 and steel is Fe 415. All columns are $300\text{mm} \times 300\text{mm}$ in size.

Design the beam B1-B2-B3

16

Draw reinforcement details.

04

TURN OVER

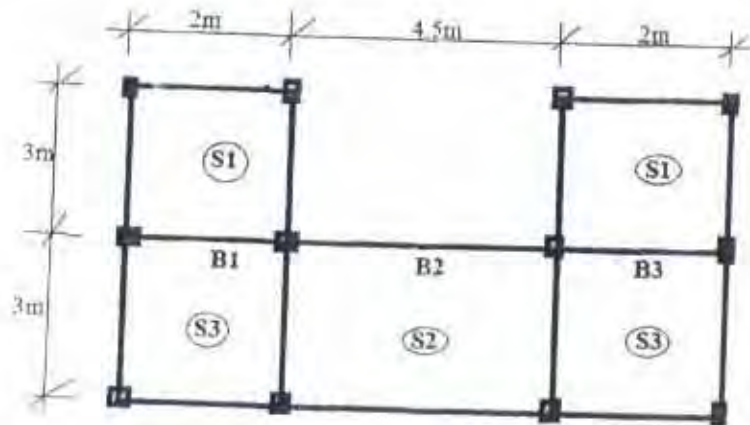


Figure 1

- Q 3 Design a doglegged staircase for a building. Available room size is $3\text{m} \times 5\text{m}$. Floor to floor height is 3.2 m. Grade of concrete is M 25 and steel is Fe 415. Draw the plan showing flight details, mid landing etc. Draw Reinforcement details in a flight.
- Q 4 Design by approximate method a rectangular tank $6\text{m} \times 5\text{m}$ in plan and 4.8 m in height. Tank is resting on firm ground. Grade of concrete is M25 and steel is Fe 415. Check the design for safe stresses. Design the following:
- (1) Side walls
 - (2) Base slab
- Draw neat sketches showing the reinforcement details.
- Q 5 Design a reinforced concrete cantilever retaining wall supporting a backfill of height 5.5 m above ground. Take density of soil = 18 kN/m^3 . Angle of repose = 30° . SBC of soil = 160 kN/m^3 and coefficient of friction between concrete and soil = 0.40. Grade of concrete is M25 and steel is Fe 415. Design the wall and show all stability checks.

TURN OVER

Draw reinforcement details of toe and stem with curtailment of 04
reinforcements.

- Q 6 a) Explain the conditions under which following types of foundations are 06
provided.
- (1) Isolated
 - (2) Combined
 - (3) Pile
 - (4) Raft.
- b) The layout plan of a square shape building shown in figure. Design a raft 10
foundation for the building. Working loads acting on each column is 500 kN.
Take net bearing capacity = 100 kN/m^3



Draw a neat sketch showing reinforcement details 04

127

14/5/19

(Time: 3 Hours)

[Total marks : 80]

NOTE:

- Question No. 1 is compulsory.
- Attempt any three out of the remaining five questions.
- Figure to the right indicates full marks
- Assume any suitable data and clearly state the same.

- Q.1 A) Discuss the role of construction equipment in speedy and economical completion of large construction projects. 10
 B) Write a short note on shaft in tunnel. 5
 C) Define and differentiate Standard equipment and Special equipment. 5
 D) Write a short note on grouting. 5
- Q.2 A) Determine owning and operating cost per hour for an excavator from the following data: 10
 Purchased cost = Rs.40 lacs
 Useful life = 15 years (2000 hours/year)
 Engine capacity = 90 HP
 Salvage value = 10% of purchase cost
 Investment cost = 12% average annual investment
 Lubrication cost = 20% of fuel cost
- B) Discuss various types of Hauling equipments with their suitability 10
- Q.3 A) What are the different types of crushers used for production of aggregate? Describe Cone crusher with neat sketch stating components and its working. 10
 B) Explain with neat sketch the drag line in respect of its working, suitability and factors affecting the performance. 10
- Q.4 A) Discuss RCC diaphragm wall with its suitability? Explain the method of construction of RCC Diaphragm wall. 10
 B) Enlist the different methods of tunneling in Soft soil. Explain any one method in detail. Suggest the various equipments required with their purpose. 10
- Q.5 A) Explain with neat sketches the working of single acting hammer and double acting hammer. 10
 B) What is mass concrete? What are the effects of mass concreting during and after placing? What precaution will you take for mass concreting? Explain. 10
- Q.6 Write short notes on any four 20
 i- Slip form work
 ii- Stone column
 iii- Vacuum concrete
 iv- Shotcreting
 v- Cladding types
 vi- Bulldozer

127

Paper / Subject Code: 52603 / Construction Management

Q.P. Code : 16394

(3 Hours)

[Total marks: 80]

N.B:

- i) Question No. 1 is compulsory.
- ii) Attempt any Three out of the remaining Five questions.
- iii) Figure to the right indicate full marks
- iv) Assume any suitable data and clearly state the same.

Q.1 Answer any four of the following: 20

- (a) What is work breakdown structure & what is its importance in planning & controlling?
- (b) Write a note on OSHA
- (c) What is Bar chart? Write the steps to prepare the bar chart.
- (d) Explain in brief the functions of material management?
- (e) Explain, Statistical quality control.

Q.2 A small project is composed of following activities as given below : 20

- (a) Draw the project network.
 - (b) What is expected project duration?
 - (c) Calculate the probability that the event 6 will occur by day 55
 - (d) Calculate the probability that the work will get over by day 100.
 - (e) Calculate the time duration for reaching event 60 corresponding to 80% probability.
- Cumulative probabilities for standard normal distribution,
 [z p]: [0.0, 50.0], [0.5, 69.1], [1.0, 84.4], [1.5, 93.3], [2.0, 97.7], [2.5, 99.3]

Activity		Estimated Duration (^{days} weeks)		
i	J	Optimistic	Most Likely	Pessimistic
1	2	10	16	20
2	3	7	10	20
2	4	5	7	8
3	5	15	18	21
4	6	25	30	32
5	7	6	9	12
6	7	21	25	28
7	8	6	8	9

Q.3 A) A network consists of the following activities with indicated duration in weeks. 12

- (a) Draw the networks.
- (b) work out all types of floats
- (c) Identify the project duration and critical path

Activity	Preceded by	Duration	Activity	Preceded by	Duration
A	INITIAL	3	E	A	5
B	A	2	F(Terminal)	B	1
C(Terminal)	D	4	G	B	2
D	E	2	H(Terminal)	E,G	3

B) Explain in detail the contribution made by F.W. Taylor in the evolution of management thought. 8

(Turn Over)

- Q.4 A). Determine the minimum cost and optimum duration for the project. The data for each activity of the network is given in the following table. 12

Indirect cost = Rs.300 / per day

Activity	t_n (day)	t_c (day)	C_n (Rs.)	C_c (Rs.)
1-2	2	2	1000	1000
1-3	7	3	500	900
2-3	6	3	300	420
2-4	5	4	200	250
3-4	0	0	0	0
3-5	9	4	600	900
4-6	11	6	600	1000
5-6	6	3	700	910

- B) Define planning in construction project. What are the advantages of planning? 8

- Q.5 A) Table below shows activities, their durations and labour requirements: 12

Activity	Duration	Carpenters
A(1-2)	8	3
B(1-3)	11	4
C(2-5)	6	2
D(3-4)	5	5
E(3-5)	8	3
F(4-5)	5	3

- a) Workout daily requirement of carpenters with all activity schedule to start at their EST, LST also prepare histogram
b) Which schedule you will prefer & why?

- B) What are the sanctions and approvals that are necessary to obtain before the commencement of the construction work in any government department? Describe in brief. 8

- Q.6 Write short notes on any four 20

- i) Job layout
- ii) Safety campaign
- iii) Occupational health hazards
- iv) Fulkerson's rule for numbering of network
- v) Minimum wages act
- vi) Network rules

70

24/5/19

Q.P. Code : 21642

[Time: Three Hours]

[Marks:80]

- N.B:
1. Question.No.1 is compulsory.
 2. Answer any three questions out of remaining five questions.
 3. Assume suitable data wherever required
 4. Figures to the right indicate full marks.

Q. 1 a) Explain effluent standards & stream standard. (20)
 b) Is it necessary to treat industrial waste? Justify the answer.
 c) Explain inplant control measures to reduce the strength of Industrial waste.
 d) Write a note on EIA.

Q. 2 a) What is oxygen sag curve? With a neat figure explain the significance of it. (05)
 b) A city discharges 100 cumecs of sewage in to a river, which is fully saturated with oxygen and flowing at a rate of 1500 cumes 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 deoxygenation (K_D) as 0.1. [Assume other data required] (10)
 c) What is equalization? Discuss the methods of equalization. (05)

Q. 3 a) Explain with a neat flow sheet manufacturing process of cotton cloth using cotton as raw material in the textile industry. (10)
 b) Why Neutralization is required for the Industrial waste? Explain the various methods of neutralization. (10)

Q. 4 a) Explain the treatment given to the electroplating industry effluent with a neat flow sheet. Also discuss the importance of segregation in this industry effluent. (10)
 b) What is environmental audit? What are the objectives of environmental audit? (05)
 c) What is UASB? Explain in brief. (05)

Q. 5 Write a short note on (Any Four) (20)
 1) Treatment of Sugar industry waste
 2) CETP
 3) Sludge drying beds
 4) Good house keeping
 5) Sampling of Industrial waste

Q. 6 a) Discuss the characteristics of dairy industry waste water. What treatment you suggest if the dairy effluent is to be disposed to (10)
 1) inland surface water
 2) Sewer
 b) Explain the manufacturing process of leather in the tannery industry with neat flow sheet. (10)

(Time: 3 Hours)

(Total Marks: 80)

N. B.: 1. Question number 1 is compulsory; attempt any three out of remaining five questions.

2. Assume suitable data if required and mention it clearly.
3. Answer and design must be in accordance to IRC and bridge rules.
4. IRC-6, IRC-18, IRC-21 and IRC-112 are permitted in examination.
5. Support answers and solutions with suitable sketches.

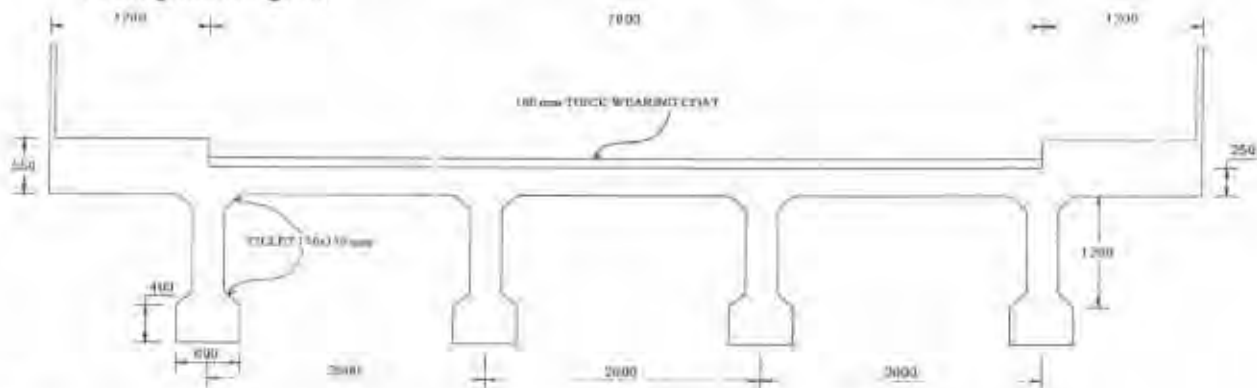
1. (a) Explain incremental method of launching of concrete girders. In which circumstances they will preferred? [04]
- (b) What are the guide lines for dimensioning of Prestressed concrete T-girder, Box girder? [04]
- (c) How load get transferred in case of PSC girder bridge from vehicle to earth? support your answer with sketch. [04]
- (d) Following statement is true or false. If false rewrite the correct statement. [04]
 - i) Elastomeric bearing is a flexible type of bearing.
 - ii) Nose to tail distance between IRC Class A or IRC Class B train of vehicles is 15m.
 - iii) Bearings are neither part of substructures nor part of superstructure.
 - iv) Dispersion of Live loads along the span through the wearing coats are only considered while calculating BM in the deck slab.
- (e) What is permissible limit for tilt or shift of a well foundation? Enlist different method to rectify tilt, explain any one. [04]

2. Design the deck slab in flexure for RC bridge to suit the following data. [20]

Clear width of roadway = 7.5m
 c/c span with bearings = 6.6m
 Live load = IRC class AA (Tracked)
 Thickness of wearing coat = 90mm
 Use Material M25, and Fe415 HYSD bars.
 Also check whether this bridge is safe for IRC class A vehicle or not, comment on it.

3. Design an interior slab panel of PSC girder bridge for flexure and shear which has to carry IRC class A vehicle. Cross girders are provided at 5m c/c and longitudinal girders are provided at 2.5m c/c. Thickness of wearing coat is 90mm. Use M30 and Fe415, refer Pigeaud's Curve. [20]

4. (a) Determine Design Shear Force on longitudinal girder of a 30m span bridge, due to IRC Class 70R tracked vehicle and self-weight of bridge superstructure. Clear carriage width is 7.8m, footpath on either side is 1.2m and cross girders are provided at 5m c/c. Thickness of deck slab is 250mm thickness of wearing coat is 100mm. Area of cross girder is 70% of area of longitudinal girder. [10]



4. (b) A simply supported post-tensioned prestressed concrete deck slab bridge of 12m effective span is designed to carry LLBM 190.78kNm & LLSF 71.32kN. Verify its safety in **flexure and shear** (preferably uncracked) for the following specifications. [10]

Carriage width: 7.5m;

Footpath on either side: 1.5m;

Wearing coat: 100mm; Depth of deck slab: 500mm;

Initial strength of concrete is 50MPa and characteristic strength is 60MPa

Characteristic strength f_{ps} of prestressing steel is 1600MPa

Cables are tensioned to 1000kN initially and spaced 300mm c/c at 100mm from soffit of the slab at mid span. Prestressing force in each cable accounting all losses is 800kN.

Consider Moderate environmental conditions.

5. (a) Locate position of IRC Class A train of vehicles along and across the bridge to produce maximum flexural effect in a PSC deck slab of span 12m and carriage width of 8m. [12]

- (b) What are the advantages of balanced cantilever bridge over a simply supported bridge and over a continuous bridge? An 80m gap is to be bridged by a balanced cantilever bridge. Suggest spacing between supports and projections for a balanced cantilever bridge. [05]

- (c) What are different types of expansion type and fixed type bearings used to restrained and permit various movements in bridges? [03]

6. (a) What are different types of foundations used in bridges? How different factors influence type of foundation? [05]

- (b) Determine Design forces due to dead and live load in diagonal member L_4U_5 of a lattice girder bridge of 50m span as shown below. [15]

Consider self-weight of different elements per meter span per track as under:

Stringers: 3000N/m, Stock rail: 500N/m, Guard rails: 400N/m,

cross beams and bracings: 3000N/m, fasteners: 3000N/m,

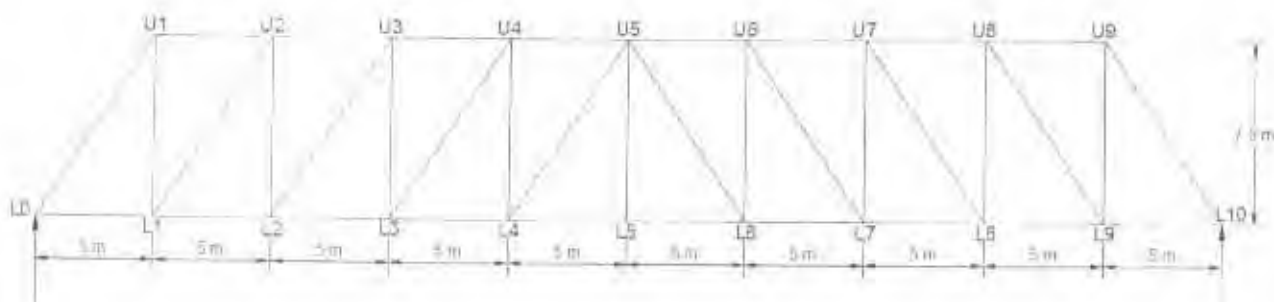
PSC sleepers are spaced 400mm c/c and are of size 2.8m x 250mm x 250mm

Take self-weight of each girder (top chord, bottom chord, diagonals and vertical members): 18000N/m.

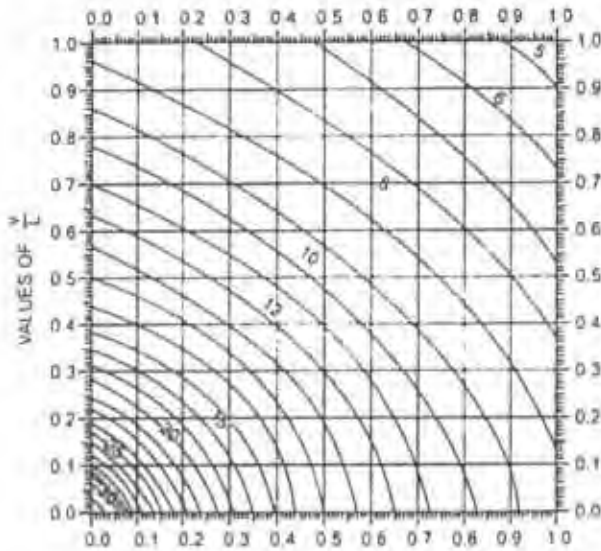
Bridge is to be designed to carry a single track Broad gauge loading-1987 as under

Span (m)	21	22	23	24	25	26	27	28	29	30
Loading*	2039	2123	2203	2280	2356	2431	2506	2580	2654	2727

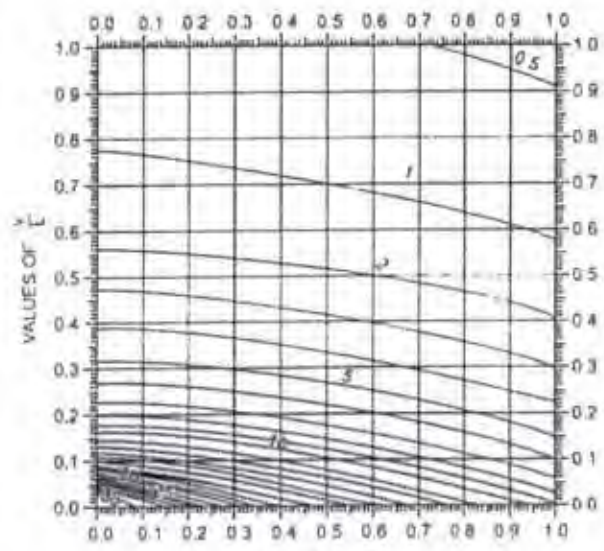
Loading* = Total live load (kN) per track; Take CDA = $[0.15 + S / (6 + L)]$



Pigeaud's Curve

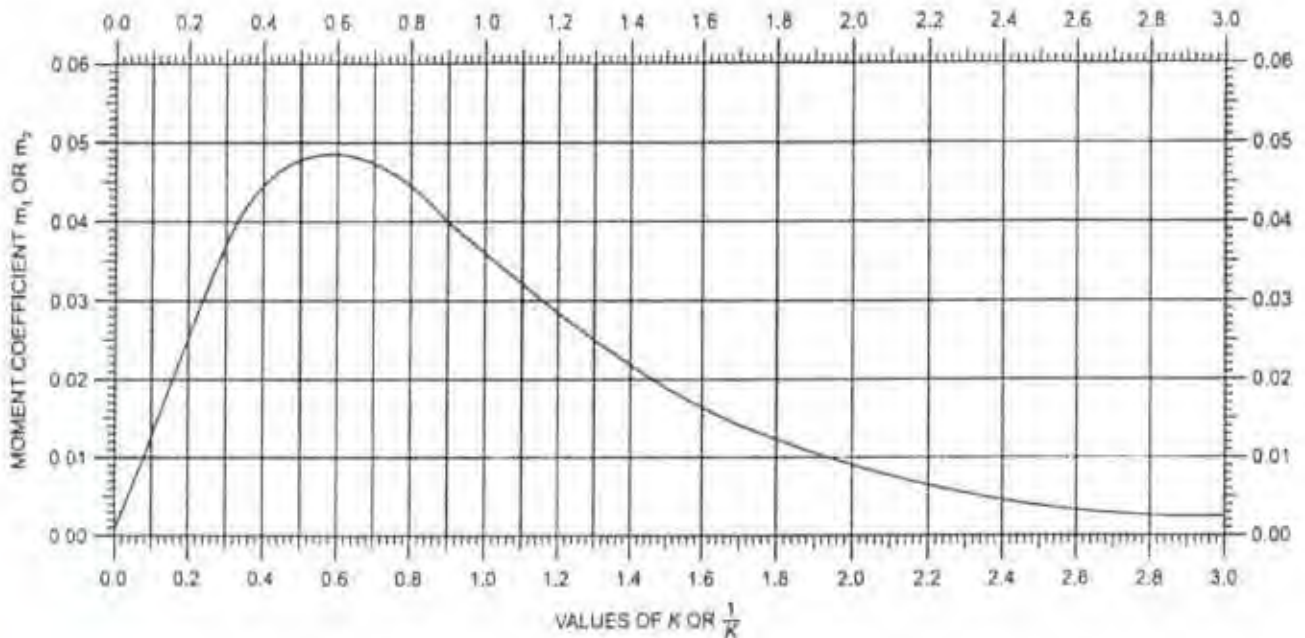


a. COEFFICIENT $m_1 = 100$



b. COEFFICIENT $m_1 = 100$

Moment Coefficients m_1 and m_2 for $K = 0.5$



Moment Coefficients for Slabs Completely Loaded with Uniformly Distributed Load.
Coefficients is m_1 for K m_2 for $1/K$