

ID NO.	
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PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 40%

Max Marks: 80

Max Time: 2 hrs.

11 May 2018, Friday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18

Course: **CIV 304 Bridge Design**

VI Sem. Civil

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Write legibly and draw clear pencil diagrams wherever required. Pen diagrams will be penalized.
- (iv) Scientific and non-programmable calculators are permitted.
- (v) The IRC 6 – 2016, Pigeaud's Charts & IRC – 21 code book is allowed for the test.

Part A

(4 Q = 30 Marks)

1. What are the two categories of foundation? List the different categories of well foundations? [5 marks]
2. What are bearings? Write few functions of bearings. [5 marks]
3. Define the following: [5 marks]
 - a. Abutment
 - b. Pier
4. Write a note on: [15 marks]
 - a. Box caisson
 - b. Solid piers
 - c. Rocker bearings

Part B

(2 Q = 25 Marks)

5. With a neat sketch write a note on Pigeaud's method [5 marks]
6. Analyze the cantilever portion of an RCC T - beam and slab bridge and calculate the Design Moment and Shear force for the following details: [20 marks]

Clear roadway = 8m
Effective span = 16m
Spacing of main girder = 3.5m
Spacing of cross girder = 4m
Width of main and cross girder = 350 mm
Depth of cross girder and main girder are equal
Width and depth of kerb = 450 x 220 mm
Thickness of wearing coat = 100 mm
Parapet = RC post (160 x 160 x 750 mm) = 0.8 kN/m @ 1.6 m c/c
Live load = IRC class A vehicle

Part C

(1 Q x 25 M = 25 Marks)

7. Analyze the interior panel of the slab of an RCC T - beam and slab bridge and calculate the Design Moment and Shear force for the following details:
 - Spacing of main girder = 3m
 - Spacing of cross girder = 3m
 - Depth of slab = 0.3 m
 - Depth of wearing course = 100 mm
 - Width of cross – girder & main girder = 300 mm
 - Live load = IRC class AA – tracked vehicle



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PRESIDENCY UNIVERSITY, BENGALURU
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Max Time: 1 hr.

28 March Wednesday 2018

TEST – 2

SET A

Even Semester 2017-18

Course: **CIV 304 Bridge Design**

VI Sem. Civil

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Write legibly and draw clear pencil diagrams wherever required. Pen diagrams will be penalized.
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- (v) The IRC 6 – 2016 & IRC – 21 code book is allowed for the test.

Part A

(1 Q x 14 M = 14 Marks)

1. Analyse a RCC deck slab required for a highway road having the following data:
 - a. Width of the carriageway = 6 m
 - b. Clear span = 5 m
 - c. Loading = IRC Class A – 2 lanes
 - d. Width of the kerb = 200 mm
 - e. Width of bearings = 400 mm
 - f. Materials = M30 grade concrete and Fe 415 steelCalculate the Bending Moment due to Live Load.

Part B

(1 Q x 10 M = 10 Marks)

2. Analyse a RCC deck slab having the following data:
 - a. Width of the carriageway = 7.5 m
 - b. Clear span = 6 m
 - c. Loading = IRC Class AA – Tracked Loading
 - d. Width of the kerb = 500 mm
 - e. Width of bearings = 500 mm
 - f. Materials = M30 grade concrete and Fe 415 steelCalculate the Shear Force due to Live load.

Part C

(1Q x 16 M = 16 Marks)

3. Analyse a RCC deck slab bridge in a portion along the alignment of a road having the following data:
 - a. Width of the carriageway = 8.0 m
 - b. Clear span = 6.4 m
 - c. Loading = IRC Class AA – Wheeled Loading
 - d. Width of the kerb = 600 mm
 - e. Width of bearings = 400 mm
 - f. Materials = M30 grade concrete and Fe 415 steelCalculate the design Bending moment.



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Weightage: 20 %

Max Marks: 40

Max Time: 1 hr.

20 Feb Tuesday 2018

TEST – 1

Even Semester 2017-18 Course: **CIV 304 Bridge Design**

VI Sem. Civil

Instruction:

- (i) Read the question properly and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Write legibly and draw clear pencil diagrams wherever required. Pen diagrams will be penalized.
 - (iv) Scientific and non-programmable calculators are permitted.
 - (v) The IRC 6 – 2016 code book is not allowed for the test.
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Part A

(4 Q x 4 M = 16 Marks)

1. Classify bridges based on:
 - a. Materials
 - b. Super structure action
2. What is the essential data required for the design of a bridge?
3. The flood discharge under the bridge is $300 \text{ m}^3/\text{s}$. If the river bed consists of coarse sand, determine the maximum scour depth under piers and abutments. (Take $f = 1.5$).
4. How many types of vehicle live loads are categorized based on their configuration and intensity? Write about IRC Class AA loading.

Part B

(2 Q x 5 M = 10 Marks)

5. What is the sequence followed while planning the construction of a bridge?
6. Determine the waterway for a bridge across a stream with a flood discharge of $225 \text{ m}^3/\text{s}$, velocity 1.5 m/s and width of flow at high flood level 60m , if the allowable velocity under the bridge is 1.8 m/s . (Use Molesworth formula).

Part C

(1Q x 14 M = 14 Marks)

7. Which factors you will consider during the appropriate site selection for a bridge? Discuss in detail.