

CBCS SCHEME

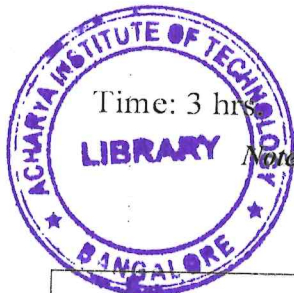
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BCV613A

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026

Design of Bridges



Time: 3 hrs

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: Bloom's level, C: Course outcomes.
3. Use of IS456, IS458, IRC-6, 21 is permitted.*

Module – 1			M	L	CO
Q.1	a.	Elaborate the classification of bridges	10	L2	CO1
	b.	Explain the different types of design loads to be considered in the design of bridges.	10	L3	CO1
OR					
Q.2	a.	Explain in brief the factors influencing the selection of site for bridges.	10	L3	CO1
	b.	Briefly discuss the terms : i) Water ways ii) Score depth	10	L2	CO1
Module – 2					
Q.3		Design a suitable RCC pipe culvert to suit the following data (code books: IRC-6, IS-458, IS456 to be provided) Discharge through pipe culvert = $1.57 \text{ m}^3/\text{s}$ Velocity of flow through pipe = 2 m/s Width of road (two lane) = 7.5 m Top width of embankment = $1.5:1$ Bed level of stream = 100.00 Top of embankment = 103.00 Loading: IRC. Class AA wheeled vehicle with a maximum wheel load of 62.5 kN Draw the longitudinal section, plan and end view of pipe culvert.	20	L4	CO2
OR					
Q.4		Design a reinforced concrete box-culvert having a clear vent way of 3.5 m by 3.5 m . The super imposed dead load on the culvert is 14 kN/m^2 . The live load on the culvert is 45 kN/m^2 . Density of soil at site is 18 kN/m^3 . Angle of repose = 30° . Adopt M_{25} grade of concrete and $Fe415$ grade of steel. Sketch the details of reinforcement in the box culvert. The loading condition is top slab supports the dead load and live load and the culvert is empty with no water pressure from inside.	20	L4	CO2

Module – 3

Q.5		Design a deck slab for the following data : Carriage way –Two lane Footpath - 1m on either side Clear span - 7m Width of bearing - 400mm Wearing coat - 80mm Load case- IRC class AA Materials: Fe415 steel and M ₂₅ concrete (limit state method)	20	L4	CO3
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OR

Q.6		Design a reinforced concrete slab culvert for IRC-class A loading through limit state method of design for the following data: Width of the road -7.5m Width of the foot path =1m on either side Clear span=5m Wearing coat thickness-75mm Width of bearing – 450mm Materials M ₂₅ grade of concrete & Fe415 steel. Loading case-IRC class A (Train)	20	L4	CO3
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Module – 4

Q.7	a.	Elaborate the design steps involved in the design of interior panel.	12	L3	CO4
	b.	With a neat sketch explain the arrangement of longitudinal and cross girder in a T beam bridge.	8	L3	CO4

OR

Q.8	a.	Explain Pigeaud's method of finding the constants for the design of interior panel of a T-beam bridge.	10	L3	CO4
	b.	Explain the load distribution among the longitudinal Girders using Courbon's method.	10	L3	CO4

Module – 5

Q.9	a.	With the neat sketches briefly explain any 4 types of abutments.	10	L3	CO5
	b.	Elaborate the types of Bridge piers with neat sketches.	10	L3	CO5

OR

Q.10	a.	Explain the types of Bridge Bearings with neat sketches.	10	L3	CO5
	b.	Briefly explain the stability analysis of piers.	10	L3	CO5

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