MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
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MANIPAL INSTITUTE OF TECHNOLOGY

VII SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATION, NOV 2022

BRIDGE ENGINEERING (CIE 4075)

(–11 - 2022)

TIME: 3 HRS. **MAX. MARKS: 50**

Note: 1. Answer all questions.
2. Any missing data may be suitably assumed.
3. Use of IS456 – 2000, IRC 6, IRC 21, Piegaud's curves is permitted

Q. NO	QUESTION	MARKS	CO
1A	What is the role of stream characteristics in designing the superstructure of a bridge? What other parameters are essential in selecting a bridge type?	(04)	**1**
1B	State the conditions under which consideration of dynamic effects of wind load becomes essential?	(03)	**1**
1C	What are the forces acting on a box culvert?	(03)	**2**
2A	Determine Linear Water way to handle the discharge for a Bridge Site, spread by a catchment area of 615 sq km. Velocity of the flow is 1.45 m/s Average Particle size of the bed material is 0.4mm. Bridge has 4 spans of 25m each. Determine the afflux and maximum scour depth**.**	(07)	**2**
2B	Why is depth of scouring essential in design of substructures? How does it affect the stability?	(03)	**5**
3A	Explain the condition when maximum moment under wheel load occurs in a one way slab bridge.	(03)	**3**
3B	An interior panel of bridge is deck 2.5m x 4m. Determine the Live load moment due to class A TRACKED VEHICLE wheel load and class B wheel load placed centrally.	(07)	**3**
4A	Distinguish between slab bridges and tee beam slab bridges?	(03)	**4**
4B	A masonry pier has a level of 102.50m at the botton and 108.00m at the top. Width at base is 3m and gradually reduces to 1.5m at top. Total dead load and live load per meter span is 2200 kN and 900 kN respectively. The bearings are placed at 450mm from the centre line of the pier. Take longitudinal forces as 140kN, velocity if water current is 3.5kN/m^2, permissible stresses in masonry in compression and tension is 2000 kN/m^2 and 250 kN/m^2 respectively. Unit weight of masonry is 22 kN/m^3. Analyze the section for stresses.	(07)	**5**
5A	Why is deep foundation preferred for bridge structures? Explain the suitability of end bearing piles and friction piles for bridge foundations.	(07)	**5**
5B	Explain the functions of roller and rocker type bearings.	(03)	**5**