

B.E. CIVIL ENGINEERING FOURTH YEAR SECOND SEMESTER EXAM 2022**Bridge Engineering
PART-I**

Time: Four Hours

Full Marks 70

Use a separate Answer-Script for each part
[IS 800, IS 456, IRC 6 are allowed]

No. of questions	Part I	Marks (35)
1 (a)	Design a well foundation for the pier of a major highway bridge. Internal diameter of a well=2.5, type of soil strata:-clayee ($k=0.033$), depth of well=25m below bed level, material M30 grade of concrete and Fe500 steel.	10
(b)	The foundation of a bridge consists of 10 piles which carry total load 9600 kN. The piles are 400X400 mm and 20 m long. Design one of the pile. Use M30 grade of concrete and Fe 500 grade of steel. Assume any other suitable data.	10
2	Design a composite bridge deck with RC slab and steel plate girders, to cover a span of 20m. Clear width of a road way=7.5m, Footpath=1.2m on either side Spacing of main Girder=2m, Live load=IRC class AA tracked vehicle, Materials- M35 grade of concrete and Fe500 grade of steel. Design the RC deck slab, the steel plate girders and shear connectors.	(7+4+4)

B.E. CIVIL ENGINEERING FOURTH YEAR SECOND SEM. EXAM. -2022**Subject: BRIDGE ENGINEERING. Time: 4 hours****Full Marks 70****PART-II (MARKS-35)**

Use a separate Answer-Script for each part

IRC-6, IRC -112, IS 456, SP 16 and required charts and tables are allowed in the exam hall

Assume any other required data if not stated

No. of questions	<u>Answer question 1 and 2</u>	Marks 10+25=35
1.	a) Describe the classification of different types of bridges briefly. b) Discuss different type of loading coming on bridges as per Indian code	5+5=10
2.	A R.C.C. Tee beam girder bridge shown in figure 1. has the following data: Clear width of carriage way=7.5 m Span (center to center of bearings) =15 m. Kerbs on either side = 600 by 300 mm Live load : IRC Class AA tracked vehicle Thickness of the wearing coat =70 mm Materials: M-25 Grade concrete and Fe-415 HYSD reinforcements. Three main girders are provided at 2.5 m center to center. The thickness of deck slab 250 mm. Width of main girder 300 mm. Assume depth of main girder and depth and width of cross girder. Cross girders are provided 3.75 m interval.	

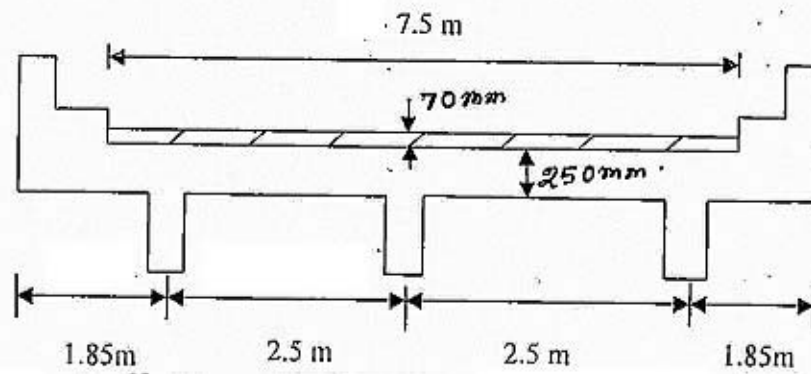


Figure 1.

Design the longitudinal girder and cross girder of the bridge using IRC 6, IRC 112 and IS 456 with the above data. Draw the necessary reinforcement detail with neat sketches.

20+5=25