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**B. Tech. 8th Sem. (Civil Engg.)  
Examination – December, 2013**

**BRIDGE ENGINEERING**

**'E' Scheme**

**Paper : CE-402(E)**

*Time : Three hours ]*

*[ Maximum Marks : 100*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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**Note :** Attempt any *five* questions. All questions carry equal marks.

1. (a) List the preliminary data to be collected by an engineer conducting investigation for a major bridge. Why is it required ? 10
- (b) The following are the costs of one pier and one superstructure span of multispan bridge for various span lengths. The cost of superstructure span excludes the costs of railing and flooring system. Calculate the economic span : 10

Span in meter	4	8	12	15
Superstructure Cost in Rs.	1,700	7,000	16,000	24,500
Substructure Cost in Rs.	22,200	23,200	23,000	23,600

2. (a) Explain IRC class 70 R loading in detail with neat sketch. 10
- (b) List the IRC codes to be used while designing road bridges on a National Highway. 5
- (c) Define clearance & width of carriage way. 5
3. (a) Discuss different types of RCC bridges giving main features of each type. 10
- (b) What are T-beam bridges? Draw a typical cross-section of T-beam RCC bridge with four beam arrangement showing the Kerbs, the railing & appropriate reinforcement for slab etc. 10
4. (a) What is the design procedure for plate girder bridges? Explain step by step. 10
- (b) List various types of steel bridges. Explain any *two* in detail. 10
5. (a) Explain with neat sketch salient features of solid bridge piers. 10
- (b) Enumerate the forces to be taken into account when designing an abutment of a bridge. 10

6. (a) Describe the various types of end bearing commonly used in steel bridges. What type of bearing will you provide for a span of 10 m? 10
- (b) Explain with the help of neat sketch various types of expansion joints. 10

7. (a) Sketch a typical well foundation indicating clearly its component part. Describe their functions. 10
- (b) Describe in detail the different types of piles & the uses to which they are put in bridge construction.

10

8. Write short note on any *four* :

$4 \times 5 = 20$

- (a) Grip length of well foundation.
- (b) Wing wall and approaches.
- (c) Articulation.
- (d) Truss bridge.
- (e) Functions of bearing.
- (f) Aesthetic consideration of bridge.