

Code: CE7T1

**IV B.Tech - I Semester –Regular / Supplementary Examinations
JANUARY - 2022**

**ADVANCED STRUCTURAL ENGINEERING
(CIVIL ENGINEERING)**

Use of relevant I.S. codes and IRC standards is permitted.
Data not given and found necessary may be assumed suitably.

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

1.

- a) Classify the different types of bridges.
- b) Sketch a deck slab bridge and name the component parts.
- c) List out the differences between Class AA and Class A IRC loadings.
- d) Enumerate the limitations of Courbon's method.
- e) List out the methods available for the analysis of circular water tank.
- f) What is an Intze Tank?
- g) What is the permissible crack width in water tanks?
- h) Define gantry girder.
- i) List the various effects of cranes to be considered under imposed loads in the design of gantry girder.

- j) Name the different loads that are considered for analysis of tower.
- k) Differentiate between transmission line tower and communication tower.

PART – B

Answer any **THREE** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) List out and explain the different loadings that are to be considered while designing the bridges according to Indian Road Congress. 8 M
- b) Write a detail note on the investigation procedure for the selection of site and the type of bridge. 8 M
3. Design a T beam bridge for IRC class AA loading with the following data.
Effective span of the bridge = 6 m
Clear width of the carriage way = 7 m
Thickness of the wearing coat = 75mm
Width of the Footpath = 0.75m (provided on one side of the bridge)
Spacing between longitudinal girders = 3m center to center.
Properties of concrete M40 grade and steel Fe 415.
Assume necessary data. 16 M

4. Design an Intz-type RCC tank upto bottom ring beam to hold 2,00,000 liters of water resisting on the ground. Bearing capacity of the soil at the site is 250kN/m^2 . Use M-25 concrete and Fe-415 steel. 16 M
5. Design of gantry girder for an electric overhead crane with the following data:
Capacity of crane = 100 KN,
Weight of trolley = 40 KN,
Weight of crane girder = 200KN,
Span of crane girder = 20 m,
Centre to Centre distance between columns = 10 m,
Minimum clearance between trolley and gantry girder = 1m,
centre to centre distance between crane wheels = 3m,
self weight of rails – 0.3 KN/m. 16 M
6. Explain the procedure for designing the communication tower? 16 M