Reg.	No
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Name.....

## B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

## Eighth Semester

Branch: Civil Engineering

ADVANCED STRUCTURAL DESIGN (C)

(Old Scheme—Prior to 2010 Admissions)

(Supplementary/Mercy Chance)

Time: Four Hours

Maximum: 100 Marks

Answer all questions.
Relevant IS codes are permitted.
Missing data may be assumed.
Each question carries 20 marks.

1. Design a RCC slab culvert for national highway for IRC class A load. Given the following data:—

Carriage way: four lane (15 m wide), footpath = 1 m on either side, clear span 6 m, wearing coat 90 mm, width of bearing = 0.45 m. Use M25 concrete and Fe415 HYSD bars.

01

- 2. Explain about slab bridges and T beam bridges with relevant sketches and specifications.
- 3. Explain general principles and structural behaviour of folded plates.

01

4. Design a RCC shell with a circular directrix given the following details:—

Distance between traverse: 35 m

Radius of the shell: 7 m

Thickness of the shell: 50 mm

Semicental angle = 60°

Live load 80 N/mm<sup>2</sup>. Use relevant steel and cement.

5. Explain the design procedure for purlins and bracing with relevant details of parameters and sketches.

Or

Turn over

6. Design a fan type steel roof truss to suit the following data:-

Span of truss - 15 m,

Spacing of truss - 4.5 m,

Roof cover - GC sheet at - 0.3 kN/m<sup>2</sup>

Wind pressure - 1.5 kN/m<sup>2</sup>,

Pitch of roof - 1/4.

7. Differentiate plate girders and gantry girders.

A riveted plate girder is simply supported over an effective span of 20 m and it carries a uniformly distributed load of 80 kN/m, in addition to its self weight. Design the plate girder assuming that it is effectively supported in lateral direction. Sketch the details of the longitudinal section and cross-section of the girder. Assume  $f_v = 250 \text{ N/mm}^2$ .

Or

- 8. Explain the design of gantry girder to carry an electrically operated crane with relevant data and diagrams.
- 9. The effective span of a through type plate girder two lane bridges is 50 m. The reinforced concrete slab is 300 mm thick inclusive of the wearing coat. The cross girders are provided at 2.5 c/c. The stringers are spaced at 2.25 m c/c. The spacing between main girders is 8 m. Determine the maximum sections for the stringers and the cross girders if the bridge is to carry IRC class A loading and sketch it.

Or

10. Explain the design of highway and railway bridges of plate girder type. Explain the significant difference.

 $(5 \times 20 = 100 \text{ marks})$ 

