FACULTY OF ENGINEERING
B.E. 4/4 (Civil) I Semester (Suppl.) Examination, July 2014
STRUCTURAL ENGINEERING DESIGN AND DETAILING – II (Steel)

Time: 3 Hours]   [Max. Marks: 75

***Note** : Answer **all** questions from Part – **A** and **any three** questions from Part – **B**.*

PART – A   (25 Marks)

1. Explain web splicing with sketches.

2. How the flange dimensions of a plate girder are decided ?

3. Write the design considerations of intermediate stiffners.

4. Under what conditions web buckling of a plate, girder take place.

5. Compare welded plate girder and riveted plate girder.

6. Explain flange splicing of plate girder.

7. What are the causes for lateral forces in a gantry girder ?

8. For a railway bridge with single track main line loading what is the allowable impact factor ?

9. Explain :
   i) Braking force
   ii) Racking force and
   iii) Tractive force.

10. Explain flange curtailment with a sketch.

PART – B   (50 Marks)

11. A simply supported riveted plate girder of 18 m effective span carries two point loads of 250 kN each at one-third point and a u.d.l of 50 kN/m over the entire span. Design the mid span section of the plate girder, check the section for shear stress and bending stress curtail the flange plates.   **15**

                     OR

12. A welded plate girder is to be designed for an effective span of 22 m. It carries a live load of 90 kN/m over the entire span, including self weight. Design an intermediate stiffner if required.   **15**

13. Design the cross-section of a gantry girder for maximum BM for the following data :
    1) Span of gantry girder = 15 m
    2) Crane capacity = 160 kN
    3) Weight of crab = 50 kN
    4) Total weight of crane girder = 120 kN
    5) Span of crane girders = 18 m
    6) Minimum approach of hook to the gantry girder = 1.0 m
    7) Wheel base = 2 m. **15**

            OR

14. Design a rocker bearing for a bridge for the following data :
    1) Total gravity load including impact = 750 kN
    2) Vertical load due to wind = 100 kN
    3) Lateral load due to wind = 50 kN
    4) Longitudinal force = 220 kN
    5) Compressive strength of concrete = 7 N/mm^2. **15**

15. Design one top chord one bottom chord and an inclined member of a pratt truss having 6 panels of 5 m each. Height of the truss is 7.5 m. The truss is subjected to EUDL of 2000 kN per track. **20**

            OR

16. Design a plate girder for deck type railway bridge. The girder is to be designed for EUDL of 2200 kN per track, the effective span of the bridge is 18 m. Design the girder at mid span section, carry out the usual checks. Draw cross section and longitudinal section of the girder. **20**

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