B.E. VIII Semester Examination, June 2015
Advanced Structure Design - II (Steel)
Time: Three Hours   www.rgpvonline.com   *Maximum Marks: 70*

Note: i) Attempt all questions. There is internal choice between questions.
ii) Assume suitable data, if found missing.
iii) Use of relevant IS code is pennitted.

1. Design a deck type plate girder railway bridge for single track B.G. loading for the following data:
   Effective span = 24 m
   Spacing of plate girder ~ 1.9 m c/c
   Weight of stock rails = 260 N/m
   Weight of guard rails = 280 N/m
   Weight of fastenings etc = 300 N/m of track
   Timber sleepers = 250 mm x 150 mm x 2.8 m @ 0.4 m c/c
   Density of timber = 7.4 kN/m^3
   Take pennissible stresses as per railway steel bridge code.   14

Or

2. Write down the design steps of half through type plate Girder
   Bridge for railways.   14

3. Design a roller bearing for a bridge using following data: Vertical load due to DL+LL+impact = 950 kN Vertical load due to wind at each end of girder = 250 kN Lateral load due to wind at each bearing = 65 kN Longitudinal load per girder = 350 kN Permissible stresses on M.S. Pin are 100 MPa in shear, 208 MPa in bearing and 208 MPa in bending. Permissible bending stress for base plate is 185 MPa and safe bearing pressure on concrete is 5000 kN/m.   14

Or

4. Write short note on: 14
   a)   Truss girder bridges for railway. b) Roller bearing. c) Rocker bearing.

5. Design an elevated cylindrical steel tank with hemispherical bottom for 2,00,000 liters capacity. The tank has conical roof. The ring beam of the tank is at a height of 12 m from the ground level. The tank is to be built at Delhi. Design upto conical roof beam and top ring angle. Take f_y = 250 N/mm^2 14

Or

6. Design top tier beam of an elevated rectangular prestressed steel tank having capacity of 1,50,000 liters. The tank is open on the top. The height of staging is 12m up to the top of columns. 14

7. Discuss in detail the design steps for guyed chimney.   14

Or

8. Design for indore a self - supporting steel stack for Jabalpur of height 60 m above the foundation and diameter of cylindrical part is 4.25 m. Foundation is raft resting on medium soil. Assume suitable data.   14

9. Design a circular silo of 12 m height and 4 m internal diameter to store cement of bulk density 14 kN/m^3 and an angle of internal friction 25°. 14

Or

10. Write short notes on the following: 14
    a)   Difference between Silos and Bunkers.
    b)   Airy's and Janssen's Theory.