T.E. (Civil) (Semester – I) Examination, 2010
INFRASTRUCTURE ENGINEERING AND CONSTRUCTION TECHNIQUES (New)
(2008 Course)

Time : 3 Hours Max. Marks : 100

Instructions : *1) Solve Q. **1** or **2**, Q. **3** or **4**, Q. **5** or **6** from Section – **I** and Q. **7** or **8**, Q. **9** or **10**, and Q. **11** or **12** from Section – **II**.*

*2) Answers to the **two** Sections should be written in **separate** books.*

*3) **Neat** diagrams must be drawn **wherever** necessary.*

*4) **Black** figures to the **right** indicate **full** marks.*

*5) **Use** of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.*

*6) Assume **suitable** data, if necessary.*

SECTION – I

1. a) State the various zones of Indian Railway. Explain in brief the organisational set up of Indian railways. **4**

   b) Draw a neat sketch of a permanent way. Also state the requirements of a good track. **6**

   c) Explain in brief the importance of coning of wheel. Also draw a neat sketch. **6**

OR

2. a) Define formation. State and explain various reasons of failure of formation. **6**

   b) Define Ballast. How minimum depth of ballast cushion is designed ? **6**

   c) Explain in brief the advantages and disadvantages of concrete sleepers. **4**

3. a) Define following terms : 6

1) Turnout 2) Tongue rail

3) Stock rail 4) Switch

5) Crossing 6) Points.

b) Define equilibrium cant. What is the equilibrium cant on a 2 degree curve on a broad gauge if 15 trains, 10 trains, 5 trains and 2 trains are running at a speed of 50 kmph, 60 kmph, 70 kmph and 80 kmph respectively ? 10

OR

4. a) What do you understand by negative superelevation ? A 5° curve diverges from a 3° main curve in reverse direction in the layout of B.G. yard. If the speed on the branch line is restricted to 35 kmph. Determine the restricted speed on main line. 8

b) Write a short note on : 8

1) Directed Track Maintenance (DTM)

2) Modernization in Indian Railways.

5. a) Compare the advantages and disadvantages of tunnels with open cut. 6

b) State various methods of Tunnel ventilation and explain any one detail. 4

c) What are the various points to be considered for selection of a site for Harbour ? 4

d) Define Dock. Differentiate between Wet Dock and Dry Dock. 4

OR

6. a) State the general sequence of operation for driving tunnels through hard rock. 4

b) What do you understand by Mucking ? State various methods of mucking and explain any one in detail. 6

c) Define breakwater. What is the necessity of breakwater ? 4

d) Write a short note on TBM. 4

SECTION – II

7. a) Highlight the importance of construction sector in any countrys' economic development, with the help of example and statistical figures. **6**

   b) Explain in brief the following : **8**

      i) Precast concrete.

      ii) Autoclave curing.

   c) Draw a neat labelled sketch of a static tower crane. **3**

OR

8. a) Explain, the need of mechanisation in the construction industry, clearly stating merits and demerits. **6**

   b) Differentiate between : **6**

      i) Precast and prefabricated elements.

      ii) Labour and equipment oriented works.

   c) "Planning a construction of any high rise structure is a very challenging job". Justify by the statement by giving suitable example. **5**

9. a) Explain in brief with suitable example, how 'scraper' is a versatile construction equipment. **4**

   b) Write a short note on following : **8**

      i) Power shovels.

      ii) Trenching Machinery.

   c) What is depreciation ? Explain any one method of depreciation. **4**

OR

10. a) Explain in brief Group behaviour of earth moving equipment. 6

b) What do you understand by "Earthwork Cycle" ? Also illustrate the importance of loader-dumper cycle time in equipment costing. 4

c) Write short notes on : 6

i) Preventive maintenance of equipments.

ii) Record keeping of equipments.

11. a) Explain in brief the 'Termie Pipe' method of underwater concreting. Also state the advantages of this method over other methods. 6

b) Differentiate between Guniting and Shotcreting. Also write one application of each. 4

c) Write a short note on : 6

i) Drilling Equipments.

ii) Grouting.

OR

12. a) Draw a schematic layout of RMC plant. Also state the advantages of RMC plant. 6

b) Explain in brief the Vacuume Dewatering System. 6

c) What is slipform shuttering ? State the distinct advantages of this method over the conventional m 4
