Total No. of Questions :5] *[Total No. of Printed Pages :3*

Roll No .....

CE - 302

B.E. III Semester

Examination, June 2015

Transportation Bridges and Tunnels

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Discuss in brief the Tractive resistances on railways.
   b) What are the functions of providing rails in a track?
   c) What is meant by wear of rails? How do you classify the wear?
   d) Compare Railway transportation with Road Transportation and mention characteristics of railway transportation.

   Or

   Discuss the different types of sleepers in use on Indian Railways and state relative merits and demerits of each. Which types of sleeper and of what material do you consider the best and why?

Unit - II

2. a) Define gradient. What are the purposes of providing gradient in railways.
   b) What are the objects of providing transition curve? Give its essential requirements
   c) What do you mean by a station yard? Discuss briefly the different types of yards.
   d) On a transitioned curve on B.G. track, the speed by railway board's speed formula: $V_S = 4.35\sqrt{R-67}$ is 1-25 times the maximum permissible speed obtained by the cant formula, after allowing the cant deficiency of 7.6 cm. If the actual cant provided is the equilibrium cant for an average speed of 60 km.p.h.
   Calculate
   i) The radius in meters.
   ii) Maximum speed (V_{max}) and
   iii) The cant to be actually provided

   Or

   What are the objects of signalling? Describe the Engineering principles of signalling and explain the different types of signals used in the station yards.

Unit - III

3. a) Define the Abutment and its functions.
   b) Define the Wing Walls and its functions.
   c) Define Afflux and indicate its importance and how is the height of Afflux worked out?
   d) What are the factors to be considered while selecting the site for a proposed bridge? And describe the aspects to be studied with respect to bridge alignment.

   Or

   Explain the various forces, loads, and stresses which are to be considered in the design of a bridge.

Unit-IV

4. a) Discuss the erection of steel girders.
   b) Explain the strengthening of bridges.
   c) Explain the sinking of wells.
   d) Explain the various types of pile foundations.

   Or

   What is a Coffer dam? Name the different types of Coffer dams and discuss their relative advantages and disadvantages.

Unit-V

5. a) Draw typical cross-section of a tunnel for a national highway.
   b) What methods will you adopt in draining the water from tunnels?
   c) What is ventilation of tunnels? What is its necessity? Explain various methods of ventilation of tunnels.
   d) Explain in details the various methods of tunnelling in hard rocks.

   Or

   Explain in details the various methods of tunnelling in soft rocks.

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