

7E7064

Roll No. \_\_\_\_\_

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7E7064

B. Tech. VII Sem. (Main/Back) Exam., Nov.-Dec.-2016

Civil Engineering

7CE4A Transportation Engineering - II

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks Main: 26

Min. Passing Marks Back: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. NIL

2. NIL

**UNIT - I**

Q.1 (a) Explain different types of rail failures with the help of neat diagrams. [8]

(b) Compare different material sleepers in tabular form. [8]

**OR**

Q.1 (a) Explain the various factors considered in selection of alignment. [10]

(b) Enlist the various factors considered in gauge selection. [6]

**UNIT - II**

- Q.2 (a) Design a turnout with 1 in 16 crossing from the following data: [8]
- (i) Gauge = 1.676m
  - (ii) Heel divergence = 13.3cm
  - (iii) Straight arm between T.N.C. and tangent point of crossing curve = 0.85m
  - (iv) Angle of crossing =  $3^{\circ}34'35''$
  - (v) Angle of switch =  $1^{\circ}34'27''$
- (b) What do you understand by crossing. Explain different types of crossing with the help of neat sketches. [2+6=8]

**OR**

- Q.2 (a) Enlist merits and demerits of various railway systems in urban areas. [8]
- (b) Draw a neat sketch of a point and also explain it's various components. [3+5=8]

**UNIT - III**

- Q.3 (a) What do you understand by widening of gauge at curve? If the wheel base of a vehicle moving on a B.G. track is 5.2m, the diameter of wheel is 1.5m and the depth of flanges below the top of rail is 3.5cm. Determine the extra width required to be provided on gauge, if the radius of curve is 160m. [3+5=8]
- (b) Explain the term superelevation. What are the objectives of providing superelevation on curves of a railway track? [4+4=8]

**OR**

- Q.3 (a) Calculate the maximum permissible speed on a curve of high speed B.G. track having following particulars:
- (i) Degree of curve =  $1^{\circ}$
  - (ii) Amount of Superelevation curve = 12cm
  - (iii) Length of transition curve = 150m
  - (iv) Maximum speed of the section likely to be sanctioned = 175 kmph. [10]

- (b) Write short notes on: [2×3=6]
- (i) Equilibrium cant.
  - (ii) Cant deficiency

**UNIT – IV**

- Q.4 (a) An airport is proposed at an elevation of 600m above mean sea level where the mean of maximum and mean of average daily temperature of the hottest month are 43.2°C and 26.4°C respectively. The maximum elevation difference along the proposed profile of runway is 5.8m. If the basic runway length is 1380m, determine the actual length of runway to be provided. [10]
- (b) What do you understand by zoning and also explain it's types and factors considered while framing zoning laws. [2+2+2=6]

**OR**

- Q.4 (a) Describe various types of runway patterns with the help of neat sketches. [8]
- (b) Write short notes on: [2×4=8]
- (i) Hanger
  - (ii) Apron

**UNIT – V**

- Q.5 (a) Describe Load classification number (LCN) method of rigid and flexible pavement design for runway. [12]
- (b) Enlist causes of failure in rigid pavement. [4]
- OR**
- Q.5 (a) Describe the Westergaard's method for design of rigid pavement for runway. [8]
- (b) Enlist various types of flexible pavement failures. [8]