

Code : 011724

B.Tech 7th Semester Exam., 2019

TRANSPORTATION ENGINEERING—II

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Choose the correct answer (any seven) :

2×7=14

(a) On Indian Railways, number of a crossing is defined as

- (i) sine of angle of crossing
- (ii) cosine of angle of crossing
- (iii) tangent of angle of crossing
- (iv) contingent of angle of crossing

(2)

(b) If n is length of a rail in metres, the number of sleepers per rail length generally varies from

- (i) n to $(n+2)$
- (ii) $(n+2)$ to $(n+4)$
- (iii) $(n+3)$ to $(n+6)$
- (iv) $(n+4)$ to $(n+5)$

(c) The rails get out of their original positions due to insufficient expansion gap. This phenomenon is known

- (i) hogging
- (ii) buckling
- (iii) creeping
- (iv) None of the above

(d) The standard dimension of a wooden sleeper for MG railway track is

- (i) 2.74 m × 25 cm × 13 cm
- (ii) 1.83 m × 20 cm × 11 cm
- (iii) 1.52 m × 15 cm × 10 cm
- (iv) 1.75 m × 20 cm × 12 cm

(e) For even distribution of load through ballast, load dispersal is assumed as

- (i) 30° to the vertical
- (ii) 45° to the vertical
- (iii) 60° to the vertical
- (iv) None of the above

(f) In the design of piers, the water pressure to be considered is

- (i) static pressure
- (ii) dynamic pressure
- (iii) impact due to cross current
- (iv) All of the above

(g) For a major bridge usually, the type of foundation is

- (i) grillage foundation
- (ii) spread foundation
- (iii) well foundation
- (iv) caisson foundation

(h) Which one of the following is not a type of culvert?

- (i) Pipe culvert
- (ii) Box culvert
- (iii) Through culvert
- (iv) Slab culvert

(i) Deep cast bearings are suitable up to _____ spans. <http://www.akubihar.com>

- (i) 6 m
- (ii) 12 m
- (iii) 12 m to 20 m
- (iv) 20 m to 30 m

(j) If a rocker and roller bearing is provided at one end of a bridge girder, then the other end will be

- (i) fixed end
- (ii) simple support
- (iii) free end
- (iv) rocker bearing

2. (a) Explain what is meant by crossing angle and crossing number, and describe the three methods of calculating the crossing angle. 7
- (b) Write a short note on diamond crossing with double slips. 7
3. (a) State the requirements of an ideal fastening connecting rail and sleeper. 7
- (b) Discuss briefly the cause and remedies of creep of rails. 7
4. (a) What are the general requirements to be fulfilled by a rail joint? Enumerate different types of rail joints. 7
- (b) Write short notes on the following : 7
- (i) Length of rail
- (ii) Corrugated rail
5. (a) Write in short on the following : 7
- (i) Cant deficiency
- (ii) Degree of a curve and its value for unrestricted speed for different gauges

- (b) What is meant by the grade or gradient of a railway track? Explain the following terms in this connection : 7
- (i) Ruling gradient
- (ii) Pusher grade
- (iii) Momentum grade
6. (a) What are the functions of a signal in respect of railway operation? 7
- (b) Find out the maximum score depth for a straight stream flow conditions for a bridge site if design discharge is 650 m^3 per second and mean diameter of soil bed particle is 0.6 mm. 7
7. Allowing for a cant deficiency of 7.5 cm, what superelevation should be provided on a 2-degree curve on BG track corresponding to a speed of 100 km/hr? What should be the length of transition if 10th gradient is not to exceed 1 in 1000? 14
8. Define the following : 14
- (a) Abutment
- (b) Pier
- (c) Wing wall

(7)

- (d) Cut water
- (e) Cylinder pier
- (f) Pile bent
- (g) Tee abutment

9. (a) Name different characteristics of aircrafts. How do they affect the planning and design of airport? 7
- (b) Enumerate various factors which you would keep in view while selecting a suitable site for an airport. 7

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