

USN

--	--	--	--	--	--	--	--	--	--



10CV63

Sixth Semester B.E. Degree Examination, June/July 2017

**Transportation Engineering – II**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.**  
**2. Missing data, if any, may be suitably assumed.**

**PART – A**

- 1 a. Mention the different gauges that are used in Indian railways. Discuss the factors affecting adoption of a particular gauge. (06 Marks)
- b. With neat sketches, explain coning of wheels and tilting of rails. (06 Marks)
- c. What is meant by wear of rails? How do you classify the wear? Discuss the various causes of wear. (08 Marks)
- 2 a. List the different fixtures used in railway track and give the dimensional sketch of fish plate. (06 Marks)
- b. Determine the quantity of materials required to construct a 800 m long BG railway track, assuming a sleeper density of  $(n + 5)$ . (06 Marks)
- c. Calculate the maximum permissible train load that a B.G. locomotive can haul with 3 pairs of driving wheels with axle load of 22 kN each on a straight level track at a speed of 80 kmph. Calculate the reduction in speed, if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a  $4^\circ$  curve on the rising gradient? Assume coefficient of friction as 0.2. (08 Marks)
- 3 a. Define: i) Super elevation ii) Negative cant  
iii) Cant deficiency iv) Grade compensation on curves (06 Marks)
- b. An  $8^\circ$  curve branches off from  $4^\circ$  main curve in B.G. layout. If the speed on branch line is 28 kmph, find the speed on main line. Cant deficiency is 7.61 cm. (06 Marks)
- c. Calculate the maximum permissible speed on a curve of highspeed B.G. track having the following particulars:  
Degree of curve =  $1^\circ$   
Amount of super elevation = 8 cm  
Length of transition curve = 130 m  
Max. speed of the section likely to be sanctioned = 153 kmph. (08 Marks)
- 4 a. Calculate the elements of a BG turnout, if heel divergence is 11.43 cm. Number of crossing is 16 and angle of switch is  $1^\circ 8' 0''$ . Straight arm distance = 0.9 m. (06 Marks)
- b. With a neat sketch show the details of acute angle crossing. Indicate: i) actual, ii) theoretical rose of crossing. (06 Marks)
- c. What is signaling? What are the objectives of signaling? List the types of signals. (08 Marks)

**PART – B**

- 5 a. Write a note on aircraft characteristics. (08 Marks)
- b. Define wind rose diagram. With a neat sketch, explain the method of locating the best orientation of runway. (06 Marks)
- c. Write a note on airport classification. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8 = 50$ , will be treated as malpractice.

- 6 a. A taxiway is to be designed for operating a Boeing aircraft, which has the following characteristics. Determine the turning radius of the taxiway.  
Wheel base  $W = 17.70$  m  
Tread of main gear = 6.62 m  
Width of taxiway,  $T = 22.5$  m  
Turn-off speed = 40 kmph  
Coefficient of friction = 0.3
- b. Explain the various types of airport markings. (06 Marks)
- c. An airport is planned at an elevation of 380 m above MSL. The monthly mean of maximum and average daily temperatures for the hottest month at the site are  $40^{\circ}\text{C}$  and  $28^{\circ}\text{C}$  respectively. The effective gradient is 0.18 percent. Determine the length of runway required at the proposed site if the basic runway length is 1900 m. (08 Marks)
- 7 a. Write short notes on:  
i) Tunnel lining (08 Marks)  
ii) Tunnel drainage (06 Marks)
- b. Explain various shapes of tunnel with neat sketches. (06 Marks)
- c. With a neat sketch, explain the needle beam method of tunneling in soft soils. (06 Marks)
- 8 a. Explain the functions of :  
i) Wharfs and quays (08 Marks)  
ii) Wet and dry docks (06 Marks)
- b. Draw a neat sketch of artificial harbor, explain the various components. (06 Marks)
- c. Define breakwater. Explain any one type of breakwater. (06 Marks)



\* \* \* \* \*