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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Sixth Semester, B.E. – Civil Engineering

Semester End Examination; June - 2016

Transportation Engineering

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

- 1 a. With neat diagram mention the requirements of an ideal permanent way. 8
- b. What are the advantages of Uniformity of Gauges? 6
- c. How the track capacity can be increased? 6
- 2 a. With suitable diagram explain coning of wheels. 8
- b. What are Train resistances? Explain. 6
- c. Find out the steepest gradient on the straight track using the following data for a train having 20 wagons, weight of each wagon = 18t, rolling resistance of wagon = 2.5 kg/t, speed of train = 50 kmph, weight, tractive effort and rolling resistance of locomotive are 120t, 12 t, and 3.5 kg/t respectively. 6

UNIT - II

- 3 a. Illustrate the various types of rail failures with neat sketches. 6
- b. Explain Check Rail and Fish Plate. 8
- c. What are the requirements of an ideal rail joints? And discuss different types of rail joints. 6
- 4 a. Describe briefly the effects of creep. How it is measured and minimized? 10
- b. What are the functions and requirements of Rails and Sleepers? 10

UNIT - III

- 5 a. Explain negative super elevation with neat diagram. 6
- b. Find out the length of the Transition Curve for BG track having 4° curvatures and a cant of 12 cm. The maximum permissible speed on curve is 85 kmph. Explain setting out of a TC. 8
- c. Draw neat diagram of Left Hand Turnout. 6
- 6 a. Calculate all the elements required to set out a 1 in 12 turnout taking off from straight BG track with its curve starting from the toe of the switch, i.e. tangential to the gauge of the outer main rail passes through TNC given heel divergence as 11.4 cm. 8
- b. What are the factors to be considered for site selection for railway stations? 6
- c. Write a note on Level Crossing. 6

UNIT - IV

- 7 a. What are the factors to be considered for selection of a suitable site for a major airport installation? Explain. 10
- b. With suitable diagram explain how do you determine the Basic Runway Length from the performance characteristics of the aircrafts using airport? 10
- 8 a. The length of runway under standard condition is 1650 m. The airport site has an elevation of 270 m and its reference temp is 32.9°C. If the runway is to be constructed with an effective gradients of 0.20%. Determine the corrected runway length. 6
- b. Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turn off speed is 80 kmph. Draw a neat sketch and show there in all the design elements. 8
- c. Write a note on Visual aids. 6

UNIT - V

- 9 a. How do you transfer the centre line from surface to underground? 8
- b. Briefly explain the method of tunnelling in hard rock. 8
- c. Write a short note on Tunnel ventilation. 4
- 10 a. Distinguish between natural and artificial harbours. 6
- b. Define Breakwater and mention its classification. 6
- c. Discriminate between Dry Dock and Wet Dock. 8

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