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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/July - 2015
Transportation Engineering – II

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

1. a. Define a Permanent Way. Discuss various factors governing the selection of a particular gauge. 6
- b. Draw a typical cross section of a permanent way and discuss briefly the basic functions of various components of a railway track. 10
- c. Explain the role of Railways in Industrial and Economic progress of a nation. 4
- 2 a. Explain the following:
 - i) Sleeper density 6
 - ii) Rail failures.
- b. Explain the causes of wear and suggest suitable measures to reduce the effects of wear on rails. 6
- c. Calculate the maximum permissible train load that a B.G. Locomotive can haul with 4 pairs of driving wheels with axle load of 20 tonnes each along a straight level stretch at a speed of 80 kmph. Calculate the reduction in speed if the train has to climb an up gradient of 1 in 150. What would be the further reduction in speed if the train has to negotiate a 3° curve along the up gradient? Take coefficient of friction as 0.16. 8
- 3 a. Write short notes on:
 - i) Cost deficiency ii) Transition curve 6
- b. With sketches and usual notations, derive an expression for equilibrium cant on B.G. track in terms of speed in kmph and radius in metre. 6
- c. Calculate the maximum permissible speed on a 3° curve of a BG track when the length of transition Curve is 60 m and the super elevation is 7 cm. The maximum values of Cant deficiency and speed likely to be sanctioned are 6 cm and 70 kmph respectively. 8
4. a. What is Marshalling yard? With a neat sketch explain the working of Marshalling yard. 6
- b. With a neat sketch show the details of Acute angle crossing. Indicate;
 - i) Actual and ii) Theoretical nose of crossing. 6
- c. Design the required elements for laying in 12 turnout with switch angle of 1°35'00" and heel divergence of 12 cm. Curve starts from the heel of switch and ends at TNC. 8

PART - B

- 5.a. What is regional planning? What information will the regional plan provide? Explain the various data to be collected for a scientific and sound regional plan. 8
- b. Define wind rose diagram. 4
- 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°C and 28°C respectively. The effective gradient is 0.18 percent. Find the length of Runway required at the proposed site if the basic Runway length is 1900 m. 8
- 6 a. What are the main functions of Taxiway? Explain briefly the factors to be considered for location of exit taxiway. 6
- b. Design an exit Taxiway joining a Runway of 45 m width and a parallel main Taxiway of 22.5m width. The total angle of turn is 30° and the turn off speed is 80 kmph. Check the stopping distance if the separation clearance is 198.70 m. 8
- c. Write a note on:
i) Airport markings OR ii) Airport lighting. 6
- 7 a. List the methods of tunneling in hard rock. Explain any one method. 6
- b. Sketch the typical cross sections of different types of tunnels. Under what circumstance is a particular type of tunnel is preferred? 6
- c. With the aid of a sketch, briefly explain the transferring of centre line form the surface in to the tunnel. 8
- 8 a. Explain with a suitable sketch, the working of a dry dock. 6
- b. Explain the following, with neat sketches:
i) Natural harbour ii) Artificial harbour 8
- c. Explain the classification of harbours, based on the natural configuration of land. 6

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