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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Sixth Semester, B.E. - Civil Engineering
Semester End Examination; May/June - 2018
Transportation Engineering

Time: 3 hrs   *Max. Marks: 100*

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

UNIT - I

1 a. What are political, social and economical advantages of railways?   6

  b. What are the requirements of an ideal permanent way?   8

  c. Discuss the factors which govern the choice of a gauge.   6

2 a. Draw a typical cross section of permanent way. Discuss function of various component of railway track.   8

  b. Write a note on coning of wheels.   4

  c. Calculate the maximum permissible train load that can be pulled by a locomotive having 4 pairs of driving wheels, carrying an axle load of 24 tonnes each. The train has to run at a speed of 100 kmph on a straight level BG track. Also calculate reduction in speed, if the train climbs a gradient of 1 in 150. If the train climbs the gradient with 4° curve, then what should be the reduction in speed? Take $\mu = 0.166$.   8

UNIT - II

3 a. Explain requirements and functions of rails.   6

  b. Define wear on rails. Explain methods to reduce wear.   8

  c. What are the advantages of welding of rails?   6

4 a. What are the requirements of good ballast? Mention the different types of ballast used in permanent way.   8

  b. Explain types of rails.   6

  c. Explain different theories of creep of rails.   6

UNIT - III

5 a. Briefly discuss the following :

   i) Grade compensation on curves   ii) Negative cant   6

  b. List the different types of curves used on railways. Explain necessity of transition curve.   6

  c. What is super elevation? List the objectives of providing super elevation on curve.   8

6 a. What is grade compensation on curve? If the ruling gradient is 1 in 180 on particular section of BG-track and at the same time a curve of it is situated on ruling gradient, what should be the allowable ruling gradient?   6

b. Draw a neat sketch of left hand turn out and show its various components parts. 6

c. What is a marshalling yard? With a neat sketch, explain the functions of marshalling yard. 8

UNIT - IV

7 a. Explain the characteristics of an aircraft which affects the planning and design of airport. 8

b. Explain the factors that influence the site selection for an airport. 6

c. A taxiway is to be designed for operating Boeing 707-320. Which has the following characteristics, determine the turning radius of the taxi way;

Wheel base = 17.7 m, thread of main loading gear = 6.2 m, coefficient of friction between tyre and pavement surface = 0.15 and turning speed = 40 kmph. 6

8 a. Mention the factors governing the location of exit taxiway. 6

b. Determine the corrected length of runway for an airport site using the following data :

Basic runway length = 2500 m, airport evaluation = 270 m, airport reference temperature = 32.94°C and runway effective gradient = 0.2%. 8

c. Mention the various assumptions made in the basic length of runway. 6

UNIT - V

9 a. Write a short note on :

i) Tunnel Lining

ii) Tunnel drainage 6

b. What is the necessity for tunnel ventilation? Explain the methods of ventilation. 8

c. What are the advantages and disadvantages of tunnels? 6

10 a. Explain classification of harbour. 6

b. With a neat sketch, explain component parts of harbour. 8

c. Explain navigation aids in harbour. 6

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