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10CV63

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Transportation Engineering – II

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain the role of rail transportation in development of country. **(08 Marks)**

b. With neat sketch, explain what is coning of wheels? What are the advantages of coning wheels? **(06 Marks)**

c. Define creep. What are the causes and effects of creep? **(06 Marks)**

2 a. What are the requirements of good ballast? Mention the different types of ballast used in permanent way. **(06 Marks)**

b. Estimate the quantity of the materials required for 2.5 km B.G track with a sleeper density of (n+7). **(06 Marks)**

c. Determine the maximum train load that can be handled by a locomotive having four pairs of driving wheel of an axle load of 28 tonnes each. On a straight track the train runs at a speed of 90 kmph. Also determine the reduction of speed if the train has an upward gradient of 1 in 150. If the train moves on a upward gradient with 3° curve, what would be the reduction of speed? Assume $\mu = \frac{1}{6}$. **(08 Marks)**

3 a. With a usual notation, derive the expression for super elevation for B.G., M.G. and N.G. track. **(06 Marks)**

b. Define gradient. Mention the different types of gradients in railway track. What is grade compensation? **(06 Marks)**

c. A 5° curve diverges from a 3° main curve in reverse direction in the layout of a B.G. yard. If the speed on the branch line is restricted to 35 kmph. Determine the restricted speed on the main line. **(08 Marks)**

4 a. Draw a neat sketch of a right hand turn out and show its various component parts. **(06 Marks)**

b. Explain briefly the working of a semaphore signal with the help of a neat sketch. **(06 Marks)**

c. Calculate all the necessary elements required to set out a 1 in 8.5 turnout, taking off from a straight B.G. track with its curve starting from the toe of the switch, i.e. tangential to the gauge face of the outer main rail and passes through theoretical nose of crossing. Given heel divergence d = 11.4 cm. **(08 Marks)**

PART – B

5 a. List the factor to be considered while selecting a suitable site for an airport. Briefly explain. **(10 Marks)**

b. What is wind rose diagram? Explain any one method of constructing wind rose diagram. **(10 Marks)**

6 a. With a neat sketch, explain how basic runway length is determined based on normal landing case and normal take-off case. **(06 Marks)**

b. Explain the factors which affect the location of exit taxi way. **(06 Marks)**

c. The length of runway under standard conditions is 1620 m. The airport site has an elevation of 270 m. Its reference temperature is 32.94°C. If runway is to be constructed with an effective gradient of 0.20%, determine the corrected runway length. **(08 Marks)**

7 a. What is tunnel? Mention its advantages. **(04 Marks)**

b. Explain a method of transfer of centre line in to the tunnel and providing grade. **(10 Marks)**

c. Explain with sketch the needle beam method of tunneling. **(06 Marks)**

8 a. Write short notes on:

(i) Natural Harbour.

(ii) Quays and Jetties.

(iii) Tetra pools. **(12 Marks)**

b. Explain with suitable sketch, the working of a dry dock. **(08 Marks)**

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