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10CV63

Sixth Semester B.E. Degree Examination, June/July 2019

Transportation Engineering – II

Time: 3 hrs. Max. Marks:100

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

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.

PART – A

1 a. Draw a neat cross section of a B.G. track in cutting for double line on a straight track and indicate the important dimensions. **(06 Marks)**

b. Define creep of rails. Explain the method of measurement of creep. **(06 Marks)**

c. Briefly explain the methods of welding of rails. Indicate the suitability of each. **(08 Marks)**

2 a. Write a brief note on Pandrol clip. **(06 Marks)**

b. Write equations for tractive resistance due to "starting" and "acceleration". Explain the terms in the equations. What would be the gradient for a B.G, track when the grade resistance together with curve resistance due to a curve of 3° shall be equal to the resistance due to ruling gradient of 1 in 100? **(06 Marks)**

c. What is meant by "crib ballast", "box ballast" and "ballast cushion"? Explain the functions of ballast. **(08 Marks)**

3 a. Explain ruling gradient and momentum gradient.
If the ruling gradient is 1 in 150 on a particular section of M.G track and at the same time a curve of 4° is situated on the gradient, what should be the allowable gradient? **(06 Marks)**

b. What is negative cant? For an unsymmetrical split, explain the method of determining the allowable speed on main track when speed on branch track is given. **(06 Marks)**

c. Find the length of transition curve on a B.G. track using the following data:
Maximum speed = 80 kmph
Cant provided = 75 mm
Rate of change of radial acceleration = 0.3 m/s^3
Radius of curve = 350 m. **(08 Marks)**

4 a. With the help of suitable diagram(s), explain "Switch angle", "heel divergence", "throw of switch" and "crossing number". **(06 Marks)**

b. Calculate the elements of a B.G. turnout using the following data:
Number of crossing = 12
Heel divergence = 133 mm
Switch angle = 1°8′
Show the elements on the diagram. **(06 Marks)**

c. With a neat sketch, explain (i) turn table (ii) shunting signal. **(08 Marks)**

PART – B

5 a. Sketch the layout of an airport and indicate the components. Explain the functions of the components. **(06 Marks)**

b. What is wind rose? With the diagram of any one type of wind rose, explain the method of getting the best orientation for runway. **(06 Marks)**

c. Briefly explain the various aircraft characteristics that affect the planning and design of airports. **(08 Marks)**

6 a. Briefly explain the various runway geometrics, as per ICAD. **(06 Marks)**

b. Design an exit taxiway which joins a runway and a main parallel taxiway. Total angle of turn = 40°, turn off speed = 65 kmph. **(06 Marks)**

c. Define basic runway length. Explain the various corrections (with equations) to be applied for the basic runway length. **(08 Marks)**

7 a. What are the advantages and disadvantages of tunnels? **(06 Marks)**

b. The centre line of a tunnel is represented by two plumb lines C and D, 4 m apart, hanging vertically on a shaft, the whole circle bearings of line CD being 80°40′15″. A theodolite is set up underground at a point A, distant 3.902 m and roughly east of nearer plumb line D and the observed value of the angle CAD is found to be 16′12″. Calculate bearing of the line CA and the perpendicular distance of A from the centre line of the tunnel. **(06 Marks)**

c. Explain liner plate method of tunneling. **(08 Marks)**

8 a. How are harbours classified based on their utility and situation? What are the requirements of commercial harbor? **(06 Marks)**

b. Write a brief note on tetrapods. **(06 Marks)**

c. Write plan and enlarged cross section of dry dock. Briefly explain. **(08 Marks)**

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