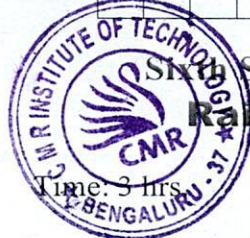


CBCS SCHEME

USN



Sixth Semester B.E. Degree Examination, Dec.2024/Jan.2025

Railways, Harbours, Tunneling and Airports

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Draw typical cross-section of permanent way. Discuss in brief the basic function of various components of railway track. (10 Marks)
- b. Calculate the maximum permissible speed on curve of high speed B.G. track having the following particulars:
Degree of curve = 1°
Amount of super elevation = 8.0 cm
Length of transition curve = 130 m
Maximum speed of section likely to be sanctioned is 150 kmph. (10 Marks)

OR

- 2 a. What is creep? Explain. (05 Marks)
- b. What is the equilibrium cant on a 2 degree curve on a B.G. if 15 trains, 10 trains, 5 trains and 2 trains are running at speeds of 50 kmph, 60 kmph, 70 kmph and 80 kmph respectively? (05 Marks)
- c. Calculate the cant deficiency and permissible speed for a 4° curve on a B.G. track. (10 Marks)

Module-2

- 3 a. Discuss in detail about modern methods of track maintenance. (10 Marks)
- b. Estimate the quantities of materials required per km length of B.G track. Given weight of rail per metre as 45×10^{-2} kN/m, length of rail as 12.8m, sleeper density = $(n + 5)$. (10 Marks)

OR

- 4 a. Enumerate the different types of station yards. With a neat sketch, explain Marshaling yard. (10 Marks)
- b. Enumerate and explain the methods of stabilization of track on poor soil. (10 Marks)

Module-3

- 5 a. Write short note on :
(i) Tunnel ventilation. (10 Marks)
(ii) Tunnel drainage. (10 Marks)
- b. Draw a neat sketch of Artificial Harbour and list the various components. (10 Marks)

OR

- 6 a. Explain the different types of Breakwaters. (10 Marks)
- b. Mention the objective of tunnel lining. List the materials used for tunnel lining. (10 Marks)

Module-4

- 7 a. Write a brief note on "Airport Classification". (10 Marks)
- b. Discuss in detail the factors affecting the choice of selection of site for an airport. (10 Marks)

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OR

- 8 a. Explain the component parts of airport. (10 Marks)
- b. Write short note on: Holding apron and imaginary surfaces. (10 Marks)

Module-5

- 9 a. The length of runway under standard condition is 1620m. The airport site has an elevation of 270m. Its reference temperature is 32.94°C . If the runway is to be constructed with an effective gradient of 0.2 percent, determine the corrected runway length. (10 Marks)
- b. What is wind rose diagram? With a neat sketch explain any one method of orientation of runway. (10 Marks)

OR

- 10 a. Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turnoff speed is 80 kmph. Draw a neat sketch and show all the design elements. (10 Marks)
- b. Explain
(i) Airport Lighting
(ii) Airport Marking (10 Marks)

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.