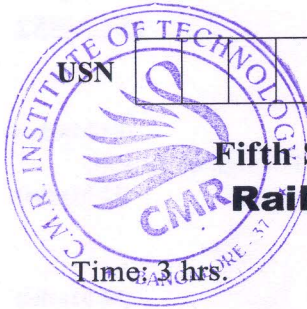


CBCS SCHEME



USN

15CV552

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Railway, Harbours, Tunnelling and Airports

Max. Marks: 80

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

Module-1

- 1 a. Draw a typical cross-section of a permanent way. Discuss in brief the basic functions of various components of a railway track. (06 Marks)
- b. Explain the necessity of sleepers in railway track. (04 Marks)
- c. If a 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a BG yard. Calculate the super elevation and the speed on the branch line. If the maximum speed permitted on the main line is 45 kmph. (06 Marks)

OR

- 2 a. Discuss the necessity of coning of wheels and tilting of rail with neat sketch. (06 Marks)
 - b. Find the speed for which super elevation is to be maintained if 10 trains, 7 trains, 5 trains and 2 trains are running at speed of 50, 60, 70 and 80 kmph respectively. (04 Marks)
- The wheel base of a vehicle moving on a BG track is 6m. The diameter of the wheel is 1524 mm and the flanges project 32 mm below the top of the rail. Determine the extra width of the gauge required, if the radius of curve is 168 m. (06 Marks)

Module-2

- 3 a. Explain the need for construction of a new railway line. (04 Marks)
- b. What are the functions of a railway station? Explain briefly the various requirements of a railway station at an important city. (06 Marks)
- c. What are the advantages and limitations of a underground railways? (06 Marks)

OR

- 4 a. What are the advantages and necessity of track maintenance? (08 Marks)
- b. Calculate the quantity of materials required for a construction of BG track of length 19500 m with a rail section of 52 kg/m and standard length of 13 m. Take sleeper density as $(M + 4)$. (08 Marks)

Module-3

- 5 a. What are the uses of tides? (04 Marks)
- b. Define a harbor. What are the requirements of a good harbor? (06 Marks)
- c. Compare mound type breakwater with wall type breakwater. (06 Marks)

OR

- 6 a. What is a tunnel? What are the advantages and disadvantages of adopting a tunnel as a means of communication? (08 Marks)
- b. Explain needle beam method with neat sketch. (08 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.

Module-4

- 7 a. What are the objectives of airport master plan? (04 Marks)
b. List and explain aircraft characteristics which affect the planning and design of airport. (12 Marks)

OR

- 8 a. Explain classification of Airport According of ICAO. (06 Marks)
b. List and explain the factors which influence selection of site for an airport. (10 Marks)

Module-5

- 9 a. What are the objects of designing the aircraft pavement? Describe the CBR method of designing the flexible pavements. (08 Marks)
b. Calculate the actual length of the runway from the following data:
Airport elevation: R.L. 100
Airport reference temperature: 28°C
Basic length of runway: 600 m
Highest point along the length: R.L. 98.2
Lowest point along the length: R.L. 95.2 (08 Marks)

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OR

- 10 a. Determine the radius of a taxiway for a supersonic aircraft to negotiate the curve at a turning speed of 60 kmph. The wheel base is 30 m and the wheel head is 7.2 m. The airport is of B type as per ICAO. (04 Marks)
b. What are the factors affecting airport lighting? (06 Marks)
c. Explain Taxiway Marking with neat sketches. (06 Marks)
