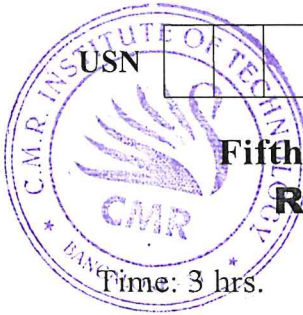


# CBCS SCHEME

15CV552



USN

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

## Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Railways, Harbours, Tunneling and Airport

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain Permanent way with a neat sketch. Mention the requirements of an ideal permanent way. (08 Marks)
- b. Define creep. What are the causes, effects and prevention of creep? (08 Marks)

OR

- 2 a. What are the requirements of good ballast? Mention the different types of Ballast used in permanent way. (08 Marks)
- b. A 5° curve diverges from 3° main curve in the Reverse direction in the layout of a B.G. Yard. If the speed on the branch line is restricted to 33 kmph. Determine the restricted speed on the main line. (08 Marks)

### Module-2

- 3 a. Estimate the quantities of materials required to construct one km long BG railway track taking the sleeper density as  $(n + 6)$ . (08 Marks)
- b. With a neat sketch, explain "Marshalling Yard". List the component. (08 Marks)

OR

- 4 a. Draw a neat sketch of right Hand Turnout and list the various parts. (08 Marks)
- b. Discuss the present scenario of Metro Rail System. (08 Marks)

### Module-3

- 5 a. Draw a neat sketch of Artificial Harbour and list the various components. (08 Marks)
- b. Explain the advantages of tunnels. Mention the different shapes of tunnels adopted for roads and railways with a neat sketch. (08 Marks)

OR

- 6 a. Discuss the following:
  - (i) Jetties
  - (ii) Mooring Buoy
  - (iii) Transit shed
  - (iv) Break water(08 Marks)
- b. Explain with a neat sketch the operations involved in needle beam method. (08 Marks)

### Module-4

- 7 a. Draw a neat sketch of an Airport Layout and list the various elements in an Airport. (08 Marks)
- b. List the characteristics of an Aircraft which affect the Design of an Airport. (08 Marks)

OR

- 8 a. What is Basic Runway Length? Explain the various corrections applied to it. (08 Marks)
- b. Determine the orientation of Runway by Plotting Wind Rose diagram, by using the data given in Table Q8(b). Find the percentage of wind coverage. (08 Marks)

| Wind Direction | Direction of Wind in % of time |
|----------------|--------------------------------|
| N              | 10.3                           |
| NNE            | 8.1                            |
| NE             | 3.9                            |
| ENE            | 1.8                            |
| E              | 1.0                            |
| ESE            | 0.4                            |
| SE             | 7.1                            |
| SSE            | 8.7                            |
| S              | 14.3                           |
| SSW            | 10.0                           |
| SW             | 5.7                            |
| WSW            | 1.6                            |
| W              | 0.5                            |
| WNW            | 0.3                            |
| NW             | 7.2                            |
| NNW            | 5.6                            |

Table Q8(b)

**Module-5**

- 9 a. The length of runway under standard conditions is 1650 mts. The airport site has an elevation of 275 mts. Its reference temperature is 32.94°C. If the runway is to be constructed with an effective gradient of 0.20%. Determine the corrected runway length. (08 Marks)
- b. Explain the various factors to be considered in selection of suitable site for airport. (08 Marks)

OR

- 10 a. Design an exit taxiway joining the runway and a parallel main taxiway. The total angle of turn is 40° and turn-off speed is 65 kmph. Assume radius of entrance curve as 517 mt. Draw a neat sketch and show all elements of an exit taxiway. (08 Marks)
- b. Write brief notes on:
- (i) Airport Marking (04 Marks)
- (ii) Airport Lighting (04 Marks)

\*\*\*\*\*