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**Question Paper Code : X10254**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
Seventh Semester  
Civil Engineering  
CE 8702 – RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING  
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

**(10×2=20 Marks)**

1. List out various defects in rails.
2. State the factors governing choice of different gauges.
3. Define track resistance.
4. List the methods of truck maintenance for a high-speed track.
5. List out the factors affecting the location of exit taxiway.
6. Mention the various surveys to be conducted for Airport.
7. Define the term clear zone.
8. Define the term approach zone.
9. What are Harbour docks ?
10. Distinguish wharves and jetties.

PART – B

**(5×13=65 Marks)**

11. a) If a  $7^\circ$  curve track diverges from a main curve of  $4^\circ$  in an opposite direction in the layout of a B.G. yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph.

(OR)

- b) If the wheel base of a vehicle moving on a B.G. track is 6 m on  $4^\circ$  curve with diameter of wheel as 1.2 m and depth of flanges below the top of rail is 3.21 cm. Determine the length of transition curve and extra width required to be provided on the gauge and also calculate the shift.

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12. a) Calculate the quantities of various materials required to lay Broad Gauge track for 1 km length and take the rail length as 13 m and section weight as 60 kg/m.

(OR)

- b) Explain outer signal, home signal, starter signal and advanced starter signal with neat sketch.

13. a) Draw the layout of basic patterns of runway configuration and discuss each pattern.

(OR)

- b) Explain broad principles of planning and factors considered for airport site selection.

14. a) Discuss the various factors considered for the orientation of runway and explain the types of windrose diagram used for orientating a runway.

(OR)

- b) Calculate the actual length of runway from the following data :

Airport Elevation – RL 100m

Mean maximum daily temperature – 31.5c

Mean average daily temperature – 27.5 c

Basic length of runway – 1600 m

Highest point along length – RL 98.2 m

Lowest point along length – RL 95.3 m.

15. a) Explain the various types of breakwaters with neat sketch.

(OR)

- b) Discuss different types of docks required in a port with the explanation on functioning of it.

**PART – C**

**(1×15=15 Marks)**

16. a) A taxi-way is to be provided for a sub sonic transport which has following characteristics. Determine the turning radius of the taxiway. Wheel base = 35 m. Tread of main loading gear = 7.1 m. Turning speed = 50 kmph. Coefficient of friction between tire and pavement surface = 0.14.

(OR)

- b) The length of runway under standard conditions is 1500 m. The airport site has an elevation of 270 m. Its mean maximum daily temperature is 31.5 c and mean average daily temperature is 27.5c. If the runway is to be constructed with an effective gradient of 0.20%, determine the corrected runway length.