

Enrollment No./Seat No.:

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering - SEMESTER - VII EXAMINATION - WINTER 2025**

**Subject Code: 3170619**

**Date: 01-12-2025**

**Subject Name: Railway and Airport Engineering**

**Time: 10:30 AM TO 01:00 PM**

**Total Marks: 70**

**Instructions**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	<b>Marks</b>
<b>Q.1 (a)</b> Define gauge of railway track. Enumerate different gauges used in India.	<b>03</b>
<b>(b)</b> Define Permanent way and Draw a neat sketch showing its main components with functions.	<b>04</b>
<b>(c)</b> Describe in brief the basic requirements of an ideal Permanent way.	<b>07</b>
<b>Q.2 (a)</b> Define Gradients. List purposes to provide Gradients.	<b>03</b>
<b>(b)</b> Derive an expression for superelevation in railway track design.	<b>04</b>
<b>(c)</b> Explain in detail the types of rail joints with sketch.	<b>07</b>
<b>OR</b>	
<b>(c)</b> A $5^\circ$ curve diverges from a $3^\circ$ main curve in reverse direction in the layout of a B.G. yard. If the speed on the branch line is restricted to 35 kmph. Determine the restricted speed on the mainline.	<b>07</b>
<b>Q.3 (a)</b> Enlist the necessity of geometric design of a railway track.	<b>03</b>
<b>(b)</b> Give types of yards. Discuss marshalling yard in detail	<b>04</b>
<b>(c)</b> Explain components or parts of Aeroplane with neat sketch.	<b>07</b>
<b>OR</b>	
<b>(a)</b> Classify the airport as per ICAO.	<b>03</b>
<b>(b)</b> Define Crossing. Enlist types of crossing and explain any one in brief.	<b>04</b>
<b>(c)</b> Find out the length of the curve for a B.G. curve track having $4^\circ$ and a cant of 12cm. The maximum permissible speed on curve is 85 kmph.	<b>07</b>
<b>Q.4 (a)</b> Define any three: approach zone, turning zone, airport capacity, runway capacity	<b>03</b>
<b>(b)</b> Describe the airport terminal building with help of the sketch.	<b>04</b>
<b>(c)</b> Elaborate various factors to be considered while selecting suitable site for an airport.	<b>07</b>
<b>OR</b>	
<b>(a)</b> Enlist fittings and fastenings commonly used for joining rails. Explain any one briefly.	<b>03</b>

(b) Explain factors that affect the necessary size of an airport. 04

(c) Define the term visual aid at airport. List the necessity of visual aids and explain the different visual aids. 07

**Q.5 (a)** Explain Runway Orientation 03

(b) Classify and briefly explain types of railway switch. 04

(c) Write a brief note on airport markings and lighting. 07

**OR**

(a) Give classification of various types of sleepers. 03

(b) Outline the functions of taxiway in airports. Draw cross sections of taxiway showing all components. 04

(c) Explain the role of Indian Railways in the social and economic development of the country. Briefly mention the strengths and weaknesses of the Indian Railways. 07

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