Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3170619 **Date: 08/06/2026**

Subject Name: Railway and Airport Engineering

Time: 02:30 PM TO 05:00 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.**

Q.1 **(a)** Define sleeper density. Enlist factors governing sleeper density. **03**

(b) Describe necessity and effects of conning of wheels. **04**

(c) Explain different types of rail sections used on B.G. and M.G. tracks in India with neat sketches. **07**

Q.2 **(a)** Define (a) Ruling gradient (b) Pusher gradient (c) Momentum gradient. **03**

(b) Explain super elevation and cant deficiency in detail. **04**

(c) Examine maximum permissible speed on a railway track from the following data. **07**
1. BG track of 3 degree curve.
2. Speed of 70 kmph for equilibrium cant.

OR

Q.2 **(c)** Calculate extra width required to be provided on gauge from the following data: **07**

a. Type of track = BG
b. Wheel base of vehicle = 6 m.
c. Diameter of wheel = 1.5 m
d. Depth of flanges below the top of rail = 3.17 cm
e. Radius of curve = 150 m.

Q.3 **(a)** Differentiate reception signal and departure signal. **03**

(b) Enlist requirements of railway station. Also explain marshalling yard in brief. **04**

(c) Draw neat sketches of the following and show its various component parts. **07**

a. Diamond crossing.
b. Acute angle crossing.
c. Left hand turnout.

OR

Q.3 **(a)** What are the objectives of signaling and interlocking in railway? **03**

(b) Explain the following terms. **04**
Trailing direction, Facing points of turnouts, Stock rails, Tongue rails.

(c) Explain the working principle of following. **07**

a. Centralized traffic control system (C.T.C system)
b. Automatic train control system (A.T.C system)

Q.4	**(a)**	Define airport capacity and explain factors affecting on it.	**03**
	(b)	Enlist and explain aircraft characteristics.	**04**
	(c)	Summarize briefly the various runway and taxiway geometrics as per recommendation of ICAO.	**07**

OR

Q.4	**(a)**	What is airport gradient? What are the requirements of gradient?	**03**
	(b)	Classify airport based on different criteria.	**04**
	(c)	Write a short note on wind rose diagram.	**07**

Q.5	**(a)**	Explain runway marking of airport with neat sketches.	**03**
	(b)	What are the objectives of air traffic control? Describe runway lighting in brief.	**04**
	(c)	Describe different corrections to be applied to calculate actual length of runway.	**07**

OR

Q.5	**(a)**	Describe the various enroute aids for controlling the air traffic on air routes.	**03**
	(b)	Write short note on Beacon light	**04**
	(c)	Write a short note on exit taxiway.	**07**

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