Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2021**

**Subject Code:3170619 Date:29/12/2021**

**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.**

| | | | Marks |
|---|---|---|---|
| **Q.1** | **(a)** | Compare railway transportation and road transportation. | **03** |
| | **(b)** | Explain the coning of wheels with neat sketch. | **04** |
| | **(c)** | Enlist various factors affecting for site selection of an airport and explain them. | **07** |
| **Q.2** | **(a)** | Write advantages and disadvantages of air transportation. | **03** |
| | **(b)** | Discuss functions and requirements of Ballast. | **04** |
| | **(c)** | Enlist various types of sleepers and discuss concrete sleepers in details. | **07** |
| | | **OR** | |
| | **(c)** | What are the functions of rails? Explain the various types of rails. | **07** |
| **Q.3** | **(a)** | Define(i) Ruling gradient ii) Pusher gradient iii) Momentum gradient | **03** |
| | **(b)** | Explain different types of gradients used in railway. | **04** |
| | **(c)** | Define Cant. On a B.G. track with 5 degree curve, calculate equilibrium cant for speed of 60 kmph. Allowing a maximum cant deficiency what would be the maximum permissible speed on the track? | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss airport master planning process as per ICAO recommendations. | **03** |
| | **(b)** | Explain different characteristics of an aircraft. | **04** |
| | **(c)** | Why regional planning is necessary? What factors affect planning of an airport? | **07** |
| **Q.4** | **(a)** | Give objectives of signalling. | **03** |
| | **(b)** | Enlist essential principles of interlocking. | **04** |
| | **(c)** | Write short note on semaphore signals. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Give the purpose of railway station. | **03** |
| | **(b)** | Give requirements of station yards. | **04** |
| | **(c)** | What are the functions of points & crossings in railway track layout? Draw a neat diagram of Diamond Crossing and show its various component parts. | **07** |
| **Q.5** | **(a)** | What is runway orientation? | **03** |
| | **(b)** | Explain in brief: (1) Exit taxiway (2) Holding apron. | **04** |
| | **(c)** | Find the design length of runway required if the length of runway at sea level under standard condition at zero gradient is 1600m.The airport site is at an elevation of 750m. The reference temperature is 20°C. Proposed runway permits ascending gradient of 0.5%. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Enlist facilities required at terminal building. | **03** |
| | **(b)** | Expain VFR and IFR. | **04** |
| | **(c)** | Write in brief about airport drainage system. | **07** |

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# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022**

**Subject Code:3170619 Date:10/06/2022**

**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.**

| | | | **MARKS** |
|---|---|---|---|
| **Q.1** | **(a)** | Enlist the different gauges used in India. | **03** |
| | **(b)** | Write short note on coning of wheel. | **04** |
| | **(c)** | What is Ballast? Write Function and requirement of good ballast | **07** |
| **Q.2** | **(a)** | Draw typical Layout of Airport Terminal Building. | **03** |
| | **(b)** | Find out the expression for sleeper density for B.G track if 19 sleepers are used under a rail length. | **04** |
| | **(c)** | Explain in detail wind rose diagram showing direction, duration and intensity of wind by drawing sketch. | **07** |
| | | **OR** | |
| | **(c)** | Describe airport master planning process as per ICAO recommendations. | **07** |
| **Q.3** | **(a)** | Enlist various types of spikes and explain any one in brief. | **03** |
| | **(b)** | Write short note on ‘super elevation’ or ‘cant’. | **04** |
| | **(c)** | 5°curve diverges from a main curve of 4° in an opposite direction in the layout of a broad-gauge yard. If the speed on the main curve is restricted to 54.33 kmph, determine the speed restriction on the branch line. Assume permissible cant deficiency as 7.5 cm. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Draw a sketch of turnout and explain its components. | **03** |
| | **(b)** | Explain causes of rail accidents and their remedial measures. | **04** |
| | **(c)** | Explain briefly requirement of an airport drainage system. | **07** |
| **Q.4** | **(a)** | Write a note on Instrument Landing System. | **03** |
| | **(b)** | Describe in brief the basic requirements of good alignment. | **04** |
| | **(c)** | Explain in detail advantages and disadvantages of air transport | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Write a note on site selection for Hangers. | **03** |
| | **(b)** | What are functions of director general of civil aviation. | **04** |
| | **(c)** | Explain briefly requirement of an airport drainage system. | **07** |
| **Q.5** | **(a)** | Draw sketch showing parts of Aeroplane. | **03** |
| | **(b)** | Describe various aircraft parking systems with figures | **04** |
| | **(c)** | An Airport is proposed at an elevation of 410 m above mean sea level where the mean of maximum and mean of average daily temperatures of the hottest month are 45°C and 26°C respectively. The maximum elevation difference along the proposed profile of | **07** |

runway is 6.5 m. If the basic length of runway is 1270 m, determine the actual length of runway to be provided

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Determine turning radius of taxiway if the speed of aircraft is 93km/hour and co efficient of friction is 0.13. | **03** |
| | **(b)** | Explain the Nose hangers and T hangers with neat sketch. | **04** |
| | **(c)** | Write a short note on runway lighting and visual aids. | **07** |

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