Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015**

**Subject Code: 2150601** **Date:17/12/ 2015**

**Subject Name: Highway Engineering**

**Time:10:30am to 1:00pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Describe Nagpur road plan with its salient features. | **07** |
| | **(b)** | Write short note on<br>(i) Central Road Research Institute(CRRI)<br>(ii) Central Road Fund (CRF). | **07** |
| **Q.2** | **(a)** | Explain briefly the various stages of work in a new highway project. | **07** |
| | **(b)** | (i)Give IRC standard for carriageway width and formation width. | **04** |
| | | (ii) Calculate the value of (i) Head light sight distance (ii) Intermediate sight distance for a highway with a design speed of 65 kmph. Take t = 2.5sec, f = 0.36 | **03** |
| | | **OR** | |
| | **(b)** | Explain curve resistance and compensation in gradient on horizontal curves. | **07** |
| **Q.3** | **(a)** | Explain Total reaction time of driver. Explain PIEV Theory. | **07** |
| | **(b)** | Calculate the extra width of pavement required on a horizontal curve of radius 700 m on a two lane highway. The design speed being 80 kmph. Assume wheel base is 6 m. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain desirable properties of bituminous mix. | **07** |
| | **(b)** | Difference between flexible and Rigid pavement. | **07** |
| **Q.4** | **(a)** | Explain Particle size classification as per IS. | **07** |
| | **(b)** | Describe Plate load test with figure. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | List out various properties of aggregate. Explain flakiness and elongation index test of aggregate. | **07** |
| | **(b)** | Explain subsurface drainage system with transverse drain with neat sketch. | **07** |
| **Q.5** | **(a)** | Write short note on ESWL. | **07** |
| | **(b)** | Explain various types of failures in Cement concrete pavements & their causes. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Draw neat sketches (i) Clover leaf interchange (ii) Rotary Interchange (ii) Diamond Interchange. | **07** |
| | **(b)** | Show the conflict point at the intersection of the following types<br>(i) Cross roads, both two-way<br>(ii) Cross roads, one way | **07** |

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