

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-III Regular Examination January 2011****Subject code: 731303****Subject Name: Traffic Flow Theories and Simulation****Date: 10 /01 /2011****Time: 02.30 pm – 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.**

- Q.1** (a) Explain deterministic model, probabilistic model and stochastic model **07**
 (b) Explain Heterogeneous traffic flow in context of developing country and discuss the problems in designing transportation infrastructure **07**
- Q.2** (a) Differentiate Macroscopic, Mesoscopic, Microscopic Traffic flow models. **07**
 (b) Explain car following model and derive the equation for the car following model. **07**
- OR**
- (b) How the arrival of vehicle distribution can be obtained? Explain procedure for the same? How you decide which type of the distribution is obtained? **07**
- Q.3** (a) Explain the fundamental relationship between, headway, speeds, density, spacing and traffic flow. **07**
 (b) Explain the fluid flow analogy of Traffic flow model. Describe any traffic flow model which developed based on the fluid flow analogy. **07**
- OR**
- Q.3** (a) What is acceleration Noise? Describe methodology to finding acceleration noise **07**
 (b) What is shockwaves? Explain with the graphical representation? Give the equation of shockwave for two different conditions. **07**
- Q.4** (a) Explain delay at Intersection? Derive equation of delay at Intersection. State its application and importance. **07**
 (b) What you understood by platoon diffusion? Explain its importance? **07**
- OR**
- Q.4** (a) Explain PCU? How the PCU concept is not solving complete problem of mixed traffic modeling? **07**
 (b) List the factor affecting capacity of highways. How the level of services is defined in the IRC. Explain? What is design volume of traffic flow and how this is differ than capacity? **07**
- Q.5** (a) Explain M/M/1 and M/D/1 queuing models. **07**
 (b) Write short note on Simulation. **07**
- OR**
- Q.5** (a) At toll collection center it is found that the 180 vehicles arrive per hour and collection of toll requires 20 seconds for each vehicle. Compare the traffic intensity, average queue length, average waiting time in queue, and average time spent in the system considering M/M/1 and M/D/1 queuing model and writes your comments on that. **07**
 (b) Write a program which generates random number between 10 km/h.to 90 km/h. which follows the normal distribution. Program also should give the frequency distribution at interval of every 10 km/h.in form of table. **07**
