

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – SUMMER • 2013****Subject code: 731101****Date: 13-05-2013****Subject Name: I.C.Engine modeling and simulation****Time: 10.30 am – 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.

- Q.1** (a) Explain and classify significance of combustion modeling for I C engine. **07**
(b) Discuss importance of modeling in context to I C engine. **07**
- Q.2** (a) Explain thin and thick spray model with its application. **07**
(b) Show basic steps of γ - $\bar{U}$ model and application of it. **07**
- OR**
- (b) What is compression generated turbulence and its effect. **07**
- Q.3** (a) What is turbulence modeling state its type. **07**
(b) Develop wiebe heat release model. **07**
- OR**
- Q.3** (a) Develop spray equation model. **07**
(b) Show steps for simulating I C engine. **07**
- Q.4** (a) Define: **07**
1. Zero dimensional modeling. 2. Single zone modeling. 3. Diffusive burning.
- (b) Explore the procedure for heat release analysis in direct injection C I engine. **07**
- OR**
- Q.4** (a) Compare different combustion system. **07**
(b) Explain diesel fuel spray structure with its major parameter. **07**
- Q.5** (a) Carried out fuel-air cycle analysis for petrol engine considering gasoline as fuel. **07**
(b) Explain different impingement regims and droplet transition condition with suitable diagram. **07**
- OR**
- Q.5** (a) Considering I C engine as open system, explain combustion efficiency and in efficiency. **07**
(b) Explain various flow processes taken place in S.I. engine during running condition with suitable sketch. **07**
