

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 731101

Date: 05/12/2011

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) Define: 07
 1) Premixed burning
 2) Diffusive burning
 3) Single-zone modeling
- (b) What is Probability density function? 07
- Q.2 (a) What is Combustion inefficiency? Does it relate with engine emission? 07
 (b) Generate phenomenological model of CI engine combustion 07
- OR
- (b) What is the significance of combustion modeling for internal combustion engine? Classify it? 07
- Q.3 (a) Carried out fuel-air cycle analysis for petrol engine considering gasoline as fuel. 07
 (b) Show the evaluation of spray elements? Explain each term. 07
- OR
- Q.3 (a) What is turbulence modeling? State its types. 07
 (b) Develop wiebe heat release model? 07
- Q.4 (a) How engine gas density influence on brake up regime boundaries? 07
 (b) Generate model for nonevaporating liquid sprays into gaseous environment. 07
- OR
- Q.4 (a) Explain wall impingement phenomenon and its effect? 07
 (b) Develop spray equation model. 07
- Q.5 (a) Derive conservation of energy equations for all zones of combustion. Show progressive evolution of combustion zones. 07
 (b) Explain various flow processes taken place in S.I. engine during running condition with suitable sketch. 07
- OR
- Q.5 (a) Describe the methodology for modeling Internal combustion engine use diesel as fuel? 07
 (b) What is the effect of compression generated turbulence on fuel injection and combustion process? 07
