Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MMTP-301(B)

M.E./M.Tech., III Semester

Examination, June 2016

Engine System Modelling and Analysis

(Elective-I)

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions. All questions carry equal marks.

1. a) What are the different types of Models? Give the difference between discrete and continuous models.
   b) What do you understand by model validation, verification and calibration?

2. a) What is Simulation? When it is preferable? Explain the benefits and pitfalls in simulation.
   b) Distinguish between solutions derived from simulation model and from analytical models.

3. a) What is stochastic variable? How does it help in simulation?
   b) Discuss in details, the discrete probability function. How it is different from continuous probability function?

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4. a) Give expressions for Binomial, Poisson and Normal distributions. Under what conditions Binomial distribution is approximated by Poisson distribution.
   b) There are 15 equally reliable semiautomatic machines in a manufacturing shop. Probability of breakdown per day is 0.15. Generate the number of break down for next seven days. Determine the mean and variance of the generated observations. Compare with the theoretical values of mean by variance.

5. Write a programme to simulate CI engine processes using an ideal diesel cycle. Generate the required data at each degree crank angle to draw the p-θ and p-V diagrams.

6. Write a computer programme to calculate the adiabatic flame temperature of any fuel for any given input conditions.

7. What is Carburetion? Explain the salient features of simulation of carburisation process in a spark ignition engine.

8. Write short notes on any one of the following :
   a) Animation in simulation
   b) Engine trouble shooting and its simulation
   c) Fuel injection process and its simulation

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