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

Roll No .....

MMTP-301(B)

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

Examination, November 2018

Engine System Modelling and Analysis

(Elective-I)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Draw neat diagrams wherever required.

1. a) Define the following terms:
   i) System concept
   ii) System environment
   iii) Model validation
   iv) Model verification
   b) What is System Modelling? Compare different types of models with their suitability.

2. a) What is Simulation? State its need and importance. Discuss its limitations.
   b) Compare solution obtained by simulation, analytical and experimental model.

3. a) What are stochastic variables? How estimation of means variance is done?
   b) Compare discrete probability function and continuous probability function.

4. a) Explain the simulation of engine system for combustion process.
   b) Discuss estimation of standard deviation in simulation.

5. a) Write and discuss uses of Combustion Charts.
   b) Describe the three steps approach to validation by Naylor and Finger.

6. A production process manufactures alternators for outboard engines used in recreational boating. On the average, 1% of the alternators will not perform up to the required standards when tested at the engine assembly plant. When shipment of 100 alternators is received at the plant, they are tested and if more than two are non-conforming the shipment is returned to the alternators manufacturer. What is the probability of returning shipment?

7. a) How Simulation of Engine Trouble Shooting is done? Discuss its reliability.
   b) List various Simulation Softwares. Discuss features of any one used now a days.

8. Write short notes on the following : (any two)
   a) Modelling of Carburetion Process
   b) Simulation of Fuel Injection Process
   c) Animation in Simulation
   d) Optimization via simulation

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