



Solve the Following Questions and assume any required data

(Question Number-1) :(22 Marks)

- Draw the details of Solex carburetor and explain its performance at part load condition (6 marks)
- Choose the suitable EFI system to replace zenith carburetor for SIE with minimal mechanical modifications. Show the advantage of the new system compared to carburetor system (6 marks)
- SIE consumes 240 g/kW.h when running at WOT, where engine speed and power are 5500 rpm and 70 kW respectively. If the engine capacity is 2 liter, evaluate the mixture quality at this operating condition and compare it with the optimum mixture quality at this condition. (5 marks)
- In the previous problem if the mixture deviates the optimum value at full load condition, estimate the engine power when running at the optimum mixture quality. Consider the other parameters remain the same (5 marks)

(Question Number-2) :(23 Marks)

- What is meant by "economical mixture" in SIE. Explain why at part load, the engine operates at the economical mixture rather than the mixture of maximum power (5 marks)
- Identify briefly the following terminology:
EFI – ECU – TBI – WOT – GDI (5 marks)
- Classify the fuel injection system used in SIE and show the advantage and disadvantage of each one. (5 marks)
- Draw flow chart to represent program used to control the speed-density injection system (8 marks)

(Question Number-3) :(22 Marks)

- Develop mathematical model to represent the change of manifold pressure with respect to design parameters. (5 marks)
- Draw sketch for EFI system of SIE employs direct air measurement technique. Discuss briefly how the system controls the mixture quality at different operating conditions and the role of each sensor in the system (5 marks)
- Explain why, using stoichiometric mixture in Diesel engine leads to smoked exhaust and loss of power, while in SIE this mixture quality leads to generate maximum power. (5 marks)
- Compare between single shot injection and split injection technique in EFI of Diesel engines in terms of engine performance and emission. (7 marks)

(1/2)

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