Reg. No._____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code**: AU 201**
Course Name**: S. I. ENGINES AND COMBUSTION (AU)**

Max. Marks: 100   Duration: 3 Hours

PART A

Answer any 3 questions.

1. In an ideal Otto cycle, the compression ratio is 8. The initial pressure and temperature of the air are 1 bar and 100°C. The maximum pressure in the cycle is 50 bar. For 1 kg of air flow, calculate the values of the pressure, volume and temperature at the four salient points of the cycle. What is the ratio of heat supplied to heat rejected? (10)

2. Discuss in detail the different losses accounted in actual cycle analysis. (10)

3. Discuss the effect of various engine variables on the phenomenon of detonation. (10)

4. (a) Define the following terms- Octane number, LCV, HCV, HUCR. (4)

 (b) In a bomb calorimeter test of gasoline, the calorific value measured was found to be 46.9 MJ/kg. If the fuel contains 14.4 % H_2 by mass, calculate the LCV of the gasoline sample tested.

 Given: the enthalpy of vaporisation of water at 25°C as 2.3 MJ/kg. (6)

PART B

Answer any 3 questions.

5. Carry out the exact analysis to calculate the air-fuel ratio for a simple carburettor.

 (10)

6. Explain briefly the different systems in MPFI system with neat sketch. (10)

7. Explain the different components of a basic ignition system considering the battery ignition system with neat sketches. (10)

8. Explain briefly the theoretical scavenging processes with neat figures. (10)

PART C

Answer any 4 questions.

9. Explain the different drives used for operating the valve mechanism with neat figures.

 (10)

10. What is meant by valve timing? What is the significance of valve timing? Explain it briefly with the help of actual valve timing diagram and compare it with theoretical valve timing diagram. (10)

11. Explain in detail the different types of mufflers used in SI engines. (10)

12. (a) Differentiate between forced and thermo-siphon cooling system (5)

    (b) What are the disadvantages of overcooling? (5)

13. (a) What are the desirable properties of engine lubricating oil? (5)

    (b) Explain the basic principle of lubrication. How will you determine the viscosity index of lubricating oil? (5)

14. Explain the different types of oil pumps used in lubrication system. (10)

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