

# **BHAGWAN MAHAVIR COLLEGE OF ENGINEERING AND TECHNOLOGY**



**MECHANICAL DEPARTMENT**

**SEMESTER - 6**

**IC ENGINE**

**ASSIGNMENTS**

**Assignment 1**

1. What do you mean by I.C. Engine? How are they classified?
2. Define Bore, stroke, Compression ratio and clearance ratio.
3. Explain working of four stroke petrol engine.
4. Define intake manifolds and their function. Discuss requirement for design of intake manifold.

## **Assignment 2**

1. Explain “air standard analysis” which has been adopted for I.C. Engine cycles. State assumption made for air standard cycles.
2. Explain valve timing diagram for four stroke diesel engine.
3. What is the difference between otto cycle and diesel cycle. Derive an expression for the efficiency and mean effective pressure of diesel engine.
4. Explain valve timing diagram for four stroke petrol engine.
5. Explain the phenomenon of dissociation.
6. Differentiate actual cycle and fuel air cycle for SI and CI engines.
7. Explain following terms.
  - I. Time losses
  - II. Spark timing
  - III. Incomplete combustion and pumping losses
  - IV. Heat loss factor.

## **Assignment 3**

1. For what purpose an orsat apparatus is used. Discuss its working with neat sketch.
2. Define adiabatic flame temperature and explain.
3. Discuss method of determining calorific value of solid and liquid fuels.
4. The petrol used in a SI engine is assume to have a chemical formula  $C_7H_{16}$ . Determine (a) stoichiometric A:F ratio, (b) if 50% excess air is supplied then find volumetric composition of dry exhaust produces. Air contains 23% of  $O_2$  and 77% of  $N_2$  by mass.

## **Assignment 4**

1. Draw neat and labeled diagram of MPFI Injection system for modern automobile engines and explain its working.
2. Explain working principle and construction detail of Bosch fuel injection pump.
3. State the different types of carburetors and explain working of any one of them.
4. Explain types of nozzles used in CI engine?
5. Define following: (i) Cloud point (ii) pour point (iii) cetane number (iv) octane number
6. Explain fuel pump used in CI engine.
7. Describe working of electronically control fuel injection system.
8. What are the criterias for selection of I.C. engine fuels.

## **Assignment 5**

1. Explain ignition requirement. Give types of ignition system and explain in detail any one of them.
2. Explain working of battery ignition system. State its advantages and disadvantages over magneto ignition system.
3. Explain various method of governing of I.C. engines and discuss any one of them.
4. Describe battery ignition system with neat sketch.

## **Assignment 6**

1. Define supercharging and explain method of supercharging and explain any one of them.
2. State objectives of supercharging.
3. Explain constant pressure turbocharging.
4. State effect of supercharging on following parameters.
  - I. Power output
  - II. Mechanical efficiency

## Assignment 7

1. Explain stage of combustion in SI engine with the help of P- $\Theta$  diagram.
2. Explain phenomenon of knocking in SI engine.
3. Explain factors affecting flame propagation in SI engine.
4. What are the basic requirements of good SI engine combustion chamber.
5. Explain factor affecting delay period in CI engine.
6. Explain following terms (i) Pre-ignition (ii) Run-on (iii) Run-away (iv) compression ratio (v) turbulence (vi) engine load



## **Assignment 8**

1. Write short note on functions of lubricating systems.
2. Discuss various requirements of an ideal lubricant.
3. Necessity of cooling of I.C. engine. Explain water cooling system.
4. Explain evaporative cooling system.
5. Why anti-freeze solution are used.
6. Explain working of thermostat in cooling system.

## **Assignment 9**

1. Explain the method of obtaining friction power and explain any one of them in details.
2. What is variable compression ratio engine and explain method of obtaining VCR and performance of VCR engine.
3. Compare performance of SI and CI engine with following variables
  - I. Power output per unit weight
  - II. Acceleration
  - III. Power output per unit piston displacement
4. Explain importance of engine testing.

## **Assignment 10**

1. Define EURO and INDIAN Norms.
2. Explain effect of different pollutants on human and plant life.
3. What are the basics types of diesel smoke. What are the ways of controlling diesel smoke.
4. Write down bharat stages of emission norms in brief for cars and two wheelers.
5. Explain different methods of measurement pollutants in exhaust gases.
6. What are the major pollutants from exhaust of gasoline and diesel engines. What are the detrimental effect of this pollutants.

## **Assignment 11**

1. State points to be selection criteria for site in diesel plants.
2. What is log sheet? State the information it provides in case diesel power plants and utility of log sheets.
3. Draw diagram of diesel power plant and discuss its operation.
4. Discuss application and advantages of diesel plants.