S.E. (Mechanical and Automobile Engineering)
APPLIED THERMODYNAMICS
(2019Pattern) (Semester-II)

1. Explain combustion stages in C.I. engine.

2. What is Common Rail Direct Injection? Explain in details.

3. Differentiate between SI Engine and CI Engine.

4. List types of fuel injection systems used in **Compression Ignition engine.**

5. Explain knocking takes place in CI engines. How it can be avoided?

6. What is octane and cetane number?

7.
   What is Exhaust gas recirculation? Explain in brief.

8. What is turbo charging? Explain in detail.

9. The following observations are made during a trial on an oil engine.
   Motor power to start the engine = 10 kW
   R.P.M. = 1500;   Brake Torque = 327.5 Nm;
   Fuel used = 20 kg/hr;   C.V. of fuel = 43 MJ/kg
   Air supplied = 4.75 kg/min;   Room Temp. = 20.8° C;
   Quantity of cooling water = 65.8° C   Exhaust gas temp. = 400° C
   Take C_p = 4.2 kJ/kg.K and C_{p_g} = 1.25 kJ/kg K
   Find: B.P., Mech. Effi., BSFC
   Draw a neat balance sheet on kW basis and percentage basis.

10. Derive an expression for optimum pressure ratio for minimum work of compression.

11. Which compressor will you select for high pressure application and for high volume delivery application?

12. What is function of ignition switch, Ballast resistor, Primary coil, secondary coil, Distributor, contact breaker, Spark plug?

13. Differentiate between battery ignition system with magneto ignition system.

14. Write short note on hydraulic governor.

15. Find the air-fuel ratio of a four-stroke, single-cylinder, air cooled engine with fuel consumption time for 100 cc is 20.4s and air consumption time for 0.15 m^3 is 16.3s. The load is 7.5 kg at the speed of 3000 r.p.m. Find also brake specific fuel consumption in g/kW-h and brake thermal efficiency. Assume the density of air as 1.175 kg/m^3 and specific gravity of fuel to be 0.75. The lower heating value of fuel is 42 MJ/kg and the dynamometer constant is 5000.