2.14 30269 INTERNAL COMBUSTION ENGINE

UNIT-1 GAS POWER CYCLES:

1.1 Otto cycle, Diesel cycle, Dual combustion cycle, Atikinson Brayton cycle
1.2 Air standard efficiency
1.3 Effect of compression ratio on efficiency
1.4 Numerical Problems

UNIT-2 PRINCIPLES OF INTERNAL COMBUSTION ENGINES:

2.1 Introduction and Classification of I.C Engines
2.2 Working principle of four stroke and two stroke cycle and their comparison
2.3 Working and special features of petrol and diesel engines and their comparison and applications
2.4 I.C.engine terms - Bore, stroke, dead centres, crank throw, compression ratio, clearance volume, piston displacement and piston speed, B.S.I. specification for I.C. engine parts
2.5 Valve timing diagrams, firing order and super charging of I.C. engines

UNIT-3 PETROL ENGINES:

3.1 Concept of Carburation, Air fuel ratio
3.2 Simple carburetors and its limitations
3.3 Description of Solex and S.U. types carburetors
3.4 Multi point fuel injection system
3.5 Mechanical and electrical feed pump
3.6 Description of coil ignition system and Magneto ignition system
3.7 Elementary idea of combustion phenomenon, detonation, pre- ignition and octane number

UNIT-4 Diesel Engines:

4.1 Description and working of Fuel feed pump
4.2 Injection of fuel, air and airless injection and fuel injectors
4.3 Elementary idea of combustion phenomenon, diesel knock, delay period and Cetane number.
4.4 Introduction to swirl and open combustion chambers
4.5 Introduction to Wankel engine

UNIT-5 COOLING, LUBRICATION AND GOVERNING:

5.1 Necessity of engine cooling
5.2 Properties of coolants
5.3 Methods of cooling and their merits and demerits
5.4 Function of Lubrication, lubrication systems of I.C. Engines
5.5 Governing methods of I.C. Engines.

6. I.C. ENGINES PERFORMANCE:

6.1 Introduction to basic performance parameters
6.2 Measurement of brake power by rope brake, prony brake and hydraulic dynamometer

6.3 Measurement of Indicated power by engine indicator and Morse test method.
6.4 Energy balance sheet of I.C. engines
6.5 Numerical problems

UNIT-7 GAS TURBINES:

7.1 Classification and application of gas turbines
7.2 Description of constant pressure (open cycle and closed cycle) and constant volume gas turbines.
7.3 Methods of increasing thermal efficiency of gas turbines, regeneration, inter cooling, reheating.
7.4 Simple numerical problems

Reference books:

1. Internal Combustion Engine Mathur& Sharma
2. Thermal Engineering (In Hindi) Verma&Gulecha
3. Thermal Engineering Vol 1 Mathur & Metha.
4. Thermal Engineering R.S. Khurmi
5. Thermal Engineering R.K.Purohit