AMAG07 FARM POWER AND RENEWABLE ENERGY SOURCES

UNIT-1 SOURCES OF FARM POWER CONVENTIONAL & NON-CONVENTIONAL ENERGY SOURCES

1.1 Classification of tractors and IC engines.
1.2 Review of thermodynamic principles of IC (CI & SI) engines and deviation from ideal cycle.
1.3 Study of engine components their construction, operating principles and functions.

UNIT-2 ENGINE SYSTEMS

2.1 Valves & valve mechanism.
2.2 Fuel & air supply, cooling, lubricating, ignition, starting and electrical systems.
2.3 Study of constructional details, adjustments & operating principles of these systems.

UNIT-3 IC ENGINE FUEL STHEIR PROPERTIES & COMBUSTION OF FUELS

3.1 Gasoline tests and their significance, diesel fuel tests and their significance,
3.2 Detonation- and knocking in IC engines, study of properties of coolants, anti-freeze and anti-corrosion materials, lubricant types & study of their properties.
3.3 Engine governing systems.

UNIT-4 ENERGY SOURCES

4.1 Introduction, Classification, Energy from Biomass, Types of biogas plants, constructional details, Principles of combustion, pyrolysis and gasification,
4.2 Types of gasifiers, Briquetting, Types of Briquetting machines, Wind energy,
4.3 Types of wind mills, Constructional details and application of wind mills;
4.4 Modern applications and future potential of renewable energy sources.

UNIT-5 SOLAR ENERGY

5.1 Solar flat plate and focusing plate collectors, Solar air heaters, Solar space heating and cooling, Solar energy applications / Solar energy gadgets, Solar cookers,
5.2 Solar water heating systems, solar grain dryers, Solar Refrigeration system, Solar ponds,
5.3 Solar photo voltaic systems, solar lantern, Solar street lights, solar fencing, Solar pumping systems.

Reference Books:

1. Liljedahl John, B., Casleton Walter, M., Turnquist Paul, K.-, and Smith David, W. (1951). Tractors and Their Power Units. John Wiley & Sons, New York.
2. Lysen, E.H. (1983). Introduction to Wind Energy. CWD, Netherlands.
3. Mathur, M.L., and Sharma, R.P. (1994). A Course in Internal Combustion Engines. Danpat Rai & Sons, Delhi.