AMCT26 FUELS AND ENERGY ENGINEERING

UNIT-1 SOLID FUEL

1.1 Wood, charcoal, coal characteristics
1.2 Formation of coal, grading of coal,
1.3 Handling and storage of coal, coal washing,
1.4 Hardness and grind ability of coal, calorific value, coal analysis.
1.5 Manufacture of coke.
1.6 Agro based solid fuels- wheat, rice, bagasse, solid oxide fuel cells.

UNIT-2 LIQUID FUEL

2.1 Origin and composition of natural oil, refining process of liquid petroleum products,
2.2 Synthetic liquid fuels- calorific value, storage and handling of liquid fuels.
2.3 Bio fuels- importance.

UNIT-3 GASEOUS FUELS

3.1 Composition and calorific value- natural gas, liquefied petroleum gas, oil gas, coal gas, producer gas, water gas, other gaseous fuels.
3.2 Non-conventional fuels – importance, hydrogen fuel.

UNIT-4 COMBUSTION PROCESS

4.1 Air requirement, combustion processes of solid, liquid, gaseous fuels,
4.2 Control of combustion process, combustion stoichiometry.

UNIT-5 HEAT TRANSFER

5.1 Heat transfer to charge by conduction, convection and radiation in a kiln,
5.2 Heat loss through kiln wall, opening, cooling etc.,
5.3 Heat balance and thermal efficiency,
5.4 Heat recovery – recuperator and regenerator,
5.5 Co-generator – importance.

References Books:

1. Wilfrid Francis and Martin C.Peter, Fuels and Fuel Technology, Pergamon Press, 1980.
2. J.P.Holman, Heat Transfer, McGraw – Hill, 1997.
3. J.D.Gilchrist, Fuels, Furnaces and Refractories, Pergamon Press, NY, 1977.