

AMAE-18 AUTOMOTIVE FUELS AND LUBRICANTS

UNIT-1 MANUFACTURE OF FUELS AND LUBRICANTS

- 1.1 Structure of petroleum,
- 1.2 Refining process, fuels,
- 1.3 Thermal cracking, catalytic cracking,
- 1.4 Polymerization, alkylation, isomerization,
- 1.5 Blending, products of refining process.
- 1.6 Manufacture of lubricating oil base stocks,
- 1.7 Manufacture of finished automotive lubricants.

UNIT-2 THEORY OF LUBRICATION

- 2.1 Engine friction: introduction, total engine friction, effect of engine variables on friction,
- 2.2 Hydrodynamic lubrication, elasto hydrodynamic lubrication, boundary lubrication,
- 2.3 Bearing lubrication, functions of the lubrication system,
- 2.4 Introduction to design of a lubricating system.

UNIT-3 LUBRICANTS

- 3.1 Specific requirements for automotive lubricants,
- 3.2 Oxidation deterioration and degradation of lubricants,
- 3.3 Additives and additive mechanism, synthetic lubricants,
- 3.4 Classification of lubricating oils, properties of lubricating oils, tests on lubricants.
- 3.5 Grease, classification, properties, test used in grease.

UNIT-4 PROPERTIES AND TESTING OF FUELS

- 4.1 Thermo-chemistry of fuels, properties and testing of fuels, relative density,
- 4.2 Calorific value, flash point, fire point, distillation, vapour pressure,
- 4.3 Spontaneous ignition temperature, viscosity, pour point, flammability, ignitability,
- 4.4 Diesel index, API gravity, aniline point, carbon residue, copper strip corrosion etc.

UNIT-5 COMBUSTION & FUEL RATING

- 5.1 SI Engines- flame propagation and mechanism of combustion,
- 5.2 Normal combustion, knocking, octane rating, fuel requirements.
- 5.3 CI Engine, mechanism of combustion, diesel knock, cetane rating, fuel requirements.
- 5.4 Additive- mechanism, requirements of an additive, petrol fuel additives and diesel fuel additives- specifications of fuels.

References Books:

1. Brame, J.S.S. and King, J.G. – "Fuels Solids, Liquids, Gaseous". Edward Arnold, 1961
2. Francis, W, "Fuels and Fuel Technology", Vol. I & II, Pergamon, 1965
3. Hobson, G.D. & Pohl, W "Modern Petroleum Technology", 1974
4. Lansdown. A.R., Lubrication, "A practical guide to lubricant selection", Pergamon press, 1982.