AMPR02 BASIC MACHINING PROCESSES

UNIT-1 LATHE

1.1 Introduction to production processes- types of production (job, batch and mass)
1.2 Production processes- Casting, Forming, Machining and Welding, Machine and Machine Tool
1.3 Lathe- Engine Lathe- block diagram- sketch- functions of each part- work holding devices in lathe- functions- Chuck, Centre, Dogs, Steady Rest and Follower Rest, mechanism of lathe
1.4 Apron, Feed, Tumbler Gear, various operations performed in Lathe- facing, turning, chamfering and knurling- relative positions of tool and job
1.5 Taper turning operations (three methods- thread cutting- thread – RH and LH, single start and multi start with application
1.6 Method of thread cutting- selection and arrangement of tool and work.
1.7 Problems in metric and inch thread conversion- Specifications of Lathe- Burnishing.

UNIT-2 SHAPER, PLANER AND SLOTTER

2.1 Purpose of shaping- block diagram- functions of each part.
2.2 Purpose of planer- block diagram- functions of each part.
2.3 Purpose of slotting machine- block diagram- functions and working principle.
2.4 Operations carried out- horizontal plane, vertical plane, v type with relative position
2.5 Comparison of planer with shaper- work holding devices in shaper and planer- Quick return mechanism in shaper- mechanical and hydraulic- cross feed mechanism-
2.6 Types of planer with application- mechanism in planer- Comparison of shaping with slotting- tool holding devices in shaper, planer and slotter- specifications of shaper, planer and slotter simple problems to calculate the velocity- speed, feed and depth of cut.

UNIT-3 DRILLING

3.1 Purpose of drilling- block diagram and function- types of drilling machines- portable drilling- bench type- sensitive drilling- radial arm drilling- functions of parts
3.2 Purpose and operation- gang milling, multiple drill head, upright drilling, relative operations-
3.3 Reaming, boring, tapping, counter boring, courses sinking, trepanning and spot facing (with simple sketch, purpose and application).
3.4 Work holding devices- specification torque calculation- speed, feed and depth of cut.

UNIT-4 MILLING

4.1 Milling machine purpose- up and down milling- classification of milling machines- slot, keyway machining- methods of milling- single piece, string, rotary, index, gang, progressive, copy.
4.2 Horizontal milling machine- block diagram- functions of each part applications
4.3 Vertical milling machine- block diagram- functions of each part applications
4.4 Gear cutting using milling machine- procedure with neat sketch- milling cutters- peripheral, face, end T slot, form etc.

4.5 Attachments and special accessories for milling- rotary, slotting attachment- indexing mechanism- methods of indexing- direct, plain, compound and differential indexing- problems- specifications- cutting conditions and parameters.

UNIT-5 GRINDING

5.1 Purpose- classification- surface finish- applications- grinding wheel- types- specifications- selection- surface grinding machine- block diagram- functions of each part- cylindrical grinding

5.2 Centerless grinding- Comparison- infeed, end feed and through feed.

5.3 Balancing, dressing, loading and truing of wheel- special grinding machines- specification of machine- cutting condition.

5.4 For all machines, demonstration to be done in a Workshop or using CD to explain the actual operation.

References Books:

1. Jain. R.K., "Production Technology", Khanna Publishers, New Delhi, 2001.
2. Hajra Choudhary etal, "Elements of Production Technology –Vol.II", Asia Publishing House, 2000.
3. Kumar. B., "Manufacturing Technology", Khanna Publishers, New Delhi 2000.
4. Radhakrishnan. P., "Manufacturing Technology, Vol.I", Scitech Publications, 2002.