

## **32065 – MACHINE TOOL TESTING AND MAINTENANCE PRACTICAL**

### DETAILED SYLLABUS

#### **OBJECTIVES**

1. Study of Indian Standard Test charts.
2. Set up instrument for machine tool testing.
3. Observe the machine tool alignment and results.
4. Observe the manufacturing accuracy of machine tools.
5. Study the maintenance of the machine components.
6. Study the trouble shooting procedures and methods.
7. Prepare the record of work for all the exercises.

#### **MACHINE TOOL TESTING**

Conduct geometrical test on machines with permissible deviations.

Study the testing instruments and calibration to the standards.

Prepare a test chart for the various tests and mention the errors.

#### **Part A: Machine Tool Alignment**

#### **EXERCISES**

1. Conduct the following test for the lathe machine and prepare a test chart.
  - Check the level of slideways.
  - Check the straightness of carriage movement.
  - Check the parallelism of tailstock movement to carriage movements.
  - Check the run-out of the spindle.
  - Check the parallelism of the axis of the outside of tailstock sleeve to carriage movement.
2. Conduct the following test for the shaping machine and prepare a test chart.
  - Check the flatness of table top face.
  - Check the parallelism of table top face to its transverse movement.
  - Check the parallelism of table top face to the ram movement.
  - Check the parallelism of T-slot of top face to the ram movement.
  - Check the squareness of table side face to its transverse movement.
3. Conduct the following test for the drilling machine and prepare a test chart.
  - Check the level of the machine. Check the flatness of the table surface.
  - Check the run-out of the internal taper of the spindle.
  - Check the straightness of the pillar and squareness of the spindle axis.

- Check the squareness of the table surface to the vertical movement of the spindle housing
4. Conduct the following test for the surface grinding machine and prepare a test chart.
- Verify the levelling of slideways.
  - Verify the straightness of slideways in a horizontal plane.
  - Verify the flatness of the table surface.
  - Verify the parallelism of the table surface.
  - Check the run-out of the wheel spindle nose.
5. Conduct the following test for the milling machine and prepare a test chart.
- Check the straightness of the vertical movement of the knee.
  - Check the squareness of the table surface to the column ways for knee.
  - Check the flatness of the table surface.
  - Check the parallelism of the table surface to its movement.
  - Check the run-out of the internal taper of the spindle.
  - Conduct the following test for the slotting machine and prepare a test chart.
  - Check the flatness of the table top face.
  - Check the run-out of the central locating bore.
  - Check the parallelism of table surface to its movement in longitudinal direction.
  - Check the squareness of the longitudinal and transverse movements of table.
  - Check the squareness of ram movement to the table surface in the transverse direction.

**Part B: Maintenance**

Dismantle, inspect and assemble the following machine components.

1. Lead screw and nut
2. Tailstock
3. Bench vice
4. Three jaw chuck
5. Four jaw chuck
6. Drill chuck