

# INDIRA TECHNICAL EDUCATION SOCIETY, NASHIK

## CERTIFICATE COURSE TURNER ( T )

**EXAM SCHEME: THEORY PAPER – I - 100 MARKS – 3 HRS.  
PRACTICAL 100 MARKS – 2 HRS.**

### THEORY SYLLABUS

#### 1. SAFETY:

- General safety, Personal safety, Mechanical tool safety, Safety rules to be observed in Workshop. First-Aid knowledge & cause of accident & its prevention.

#### 2. UNITS OF MEASUREMENTS:

- British & Metric system of units, its conversions in respect of measurements for e.g. linear, Area & volume.

#### 3. MEASURING INSTRUMENTS:

- Classification of measuring Instruments.
- Precision Instruments: - Micrometer (Out side, inside, depth gauge)  
Calipers: Vernier Caliper, Height Gauge, steel rule, Try square slip gauge, sine bar.
- Non-precision Instruments: Steel rule.  
Caliper: Outside, Odd leg divider, Combination set, try square  
Marking tools: Scriber & Scribing block, Surface plate, punches, hammers, Angle plate, Vee block, Marking Media (Persian Blue, Red Lead, Chalk).

#### 4. CUTTING TOOLS:

- Study of different cutting tools such as chisels, hacksaw blade.
- Files: Description, its material, grades, cuts & its parts uses. Specification. Care & Maintenance of files File cards, pining of files, Special types of files such as needle files, Safe edge files, hand file etc.
- Cutting tools, its uses & selection of special tools such as drill, reamers, grinding wheels, knowledge of re sharpening of these tools.
- Drill: Knowledge of standard drill sizes such as letter No. & fractional drill nomenclature of drill & important angle of drill, causes of breakage of drill. Importance of cutting speed and feed for drilling.
- Use of Tap and Die Material for Tap & Die safety precautions while tapping.

#### 5. HOLDING DEVICE:

- Work Holding Devices: Construction & use of devices such as bench vice, Machine vice, Clamps, Parallel block, step block, Nuts & Bolts etc.
- Cutting tools holding Device: Knowledge of holding devices such as sockets, Sleeves, Drill chucks, die stock & Top range.

#### 6. GENERAL HAND TOOLS:

Knowledge and importance of workshop, hand tools such as screw driver, Spanners, Single ended, ring spanner, pliers, mallet, soft hammer etc.

## **7. ENGINEERING FASTNER:**

- Types of standard threads, such as metric BSW, BSP, BA, square, knuckle, ACME Threads and their applications.
- Types of screw such as counter sunk, Hexagonal, square half round headed screw, Allenkey.
- Importance of fasteners in workshop practice, permanent fastener such as rivets, welding, Soldering, brazing, types and method of riveting.
- Temporary fastener: Various types of keys, pins, and cotters nuts and bolts. Studs, Washers etc.

## **8. LUBRICATION & LUBRICATIONS:**

- i) Importance of coolants & Lubrication in workshop.
- ii) Properties of Lubricants, coolants for various metals.
- iii) Types of coolants, Lubricants used for machines.
- iv) Preventive Maintenance necessity. Advantages & Types of maintenance.

## **9. LIMITS, FITS, TOLERANCE & INTERCHANGEABILITY:**

Standard systems of limits, fits & tolerance as per Indian standard, concept of Interchangeability.

## **10. JIGS & FIXTURES:**

Construction & necessity of jigs & fixture, principles of jigs & fixture, Material used for Jigs & fixtures.

## **11. LATHE MACHINE:**

- i) Familiarization with lathe machine.
- ii) Function of Lathe Machine and safety precaution to be observed while working on Lathe Machine.

## **12. LATHE MACHINES SPECIFICATIONS:**

- i) Lathe machine main parts such as head stock, Tail stock, Carriage feed screw and lead screw.
- ii) Lathe machine driving mechanism – Gear driving and belt driving. Use of back gear.

## **13. TYPES OF LATHE MACHINES:**

Understand different types of lathe machines such as center Lathe, Bench Lathe, Capstan Lathe and turret Lathe, special lathe (Gap Bed Lathe).

## **14. LATHE MACHINE ACCESSORIES AND ATTACHMENTS:**

Study of the Lathe accessories such as Centers, Carrier Catch plate, Chuck face plates, Collate, Driving plate, Mandrel and tool post etc.

## **15. LATHE OPERATIONS:**

- i) Understand basic common lathe operations such as facing, plain turning, centering, step Turning, shoulder turning, grooving, chamfering, boring etc.
- ii) Special Lathe Operations: Taper Turning, Use of Taper, Methods of calculation and Formulae.

**16. INTRODUCTION TO C.N.C:**

- i) Operations of C.N.C. machines.
- ii) Fundamental components and its function.
- iii) Types of N.C.
- iv) a)Point to point control b) Continues path control.
- v) Types of N.C. system and its function.
  - a) Open loop      b) Closed loop.
- vi) Brief knowledge of binary arithmetic.
- vii) Advantage of C. N. C

**SCHEME OF EXAMINATION**

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|---------------------|----------|------------------|----------------|
| <b>Theory Paper</b> | <b>:</b> | <b>100 Marks</b> | <b>3 Hours</b> |
| <b>Practical</b>    | <b>:</b> | <b>75 Marks</b>  | <b>2 Hours</b> |
| <b>Journal</b>      | <b>:</b> | <b>15 Marks</b>  |                |
| <b>Oral</b>         | <b>:</b> | <b>10 Marks</b>  |                |

