

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2022**

METALLURGY AND MACHINE TOOLS

[Maximum Marks: 100]

[Time: 3 Hours]

PART-A

[Maximum Marks: 10]

I. (Answer *all* questions in one or two sentences. Each question carries 2 marks)

1. Draw the cooling curve for pure iron and mark different phases.
2. List any two advantages of Powder Metallurgy.
3. Write any two functions of cutting fluids.
4. Describe any two methods to specify the milling machine.
5. List any four operations performed using shaper machine. (5 x 2 = 10)

PART-B

[Maximum Marks: 30]

II. (Answer *any five* of the following questions. Each question carries 6 marks)

1. Describe the Continuous Cooling Transformation diagram (CCT diagram) with sketch.
2. Describe Austempering of steels.
3. Draw the geometry of orthogonal cutting and mark important parts.
4. List any six work holding devices in lathe.
5. Write any four methods of Specify the drilling machines for procurement.
6. Explain any four methods of specifying planner machine.
7. State the working principle of slotting machine with neat sketch. (5 x 6 = 30)

PART-C

[Maximum Marks: 60]

(Answer *one* full question from each Unit. Each full question carries 15 marks)

UNIT – I

- III. (a) Draw the iron-carbon equilibrium diagram and mark important phases. (9)
- (b) Identify the various phases of iron-carbon equilibrium diagram. (6)

OR

- IV. (a) Compare annealing and normalizing. (8)
- (b) Explain the following case hardening process (a) Cyaniding (b) Nitriding and (c) Carburizing (7)

UNIT – II

- V. (a) Explain about the Tool signature/ Nomenclature of the single point cutting tool with a line Sketch of single point cutting tool. (9)
- (b) List any six factors affecting the life of cutting tools. (6)

OR

- VI. (a) Describe the following lathe operation with line sketches. (8)
- (i) Turning (ii) Facing (iii) Taper turning (iv) Boring.
- (b) Explain any seven desirable properties of cutting fluids. (7)

UNIT- III

- VII. (a) Describe the following operations. (8)
- (i) Reaming (ii) Boring (iii) Counter boring (iv) Counter sinking
- (b) List any six work holding devices for drilling. (7)

OR

- VIII. (a) Explain the following milling operations. (8)
- (i) Face milling (ii) Plain milling (iii) Angular milling (iv) Form milling
- (b) Describe the working of vertical milling machine with line sketch and mark important parts. (7)

UNIT - IV

- IX. (a) List any six operations performed using shaping machine. (6)
- (b) Explain crank and slotted lever quick return motion mechanism of shaper machine. (9)

OR

- X. (a) Compare Shaper & Slotter. (9)
- (b) Describe any four methods of specifying slotter machine. (6)
