

TED (15/19) - 4023
(REVISION-2015/19)

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Reg.No.....
Signature.....

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2023**

METALLURGY & MACHINE TOOLS

(Maximum Marks:100)

(Time: 3 Hours)

PART - A
(Maximum Mark : 10)

Marks

I. Answer all the questions in one or two sentences. Each question carries 2 marks.

1. List any four heat treatment processes.
2. What do you mean by orthogonal cutting?
3. Name the lathe operation performed by using lead screw and half nut.
4. Define reaming operation.
5. Give any two ways of specifying a shaper.

(5 x 2 = 10)

PART - B
(Maximum Mark: 30)

II Answer *any five* questions from the following. Each question carries 6 marks.

1. Enumerate some advantages of powder metallurgy.
2. Mention some of the objectives of heat treatment processes.
3. Enumerate the desirable properties of cutting fluids.
4. Give the nomenclature of a taper shank twist drill.
5. Name the different types of drilling machines.
6. Sketch a plain milling cutter and mark the important elements.
7. Make a comparison between a shaper and a planar.

(5 x 6 = 30)

P.T.O

PART – C

(Maximum Mark: 60)

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

UNIT - I

- III (a) Draw the Iron – Carbon equilibrium diagram showing various phases and critical lines. (8)
- (b) Draw the various processes involved in the production of a component using powder metallurgy. (7)

OR

- IV (a) List the different types of crystal defects. Explain Interstitial defect and Substitutional defect. (8)
- (b) Briefly explain:
(i) Annealing (ii) Tempering (7)

UNIT – II

- V (a) Describe the characteristics of a cutting tool material. (8)
- (b) Draw the single point cutting tool nomenclature. (7)

OR

- VI (a) Write down eight main parts of a centre lathe and eight machining operations that can be performed in a lathe. (8)
- (b) Explain the different types of chips formed during metal cutting operations with simple sketches. (7)

UNIT – III

- VII (a) Draw the line diagram of a radial drilling machine and mark all parts. (8)
- (b) Explain (i) Straddle milling (ii) Gang milling (7)

OR

- VIII (a) Neatly sketch any four work holding devices used with drilling machine. (8)
- (b) Draw the neat sketch of horizontal milling machine and label all parts. (7)

UNIT – IV

- IX (a) Explain the automatic feed mechanism in a shaper. (8)
- (b) Draw and explain the crank and slotted lever mechanism in a shaper. (7)

OR

- X (a) Draw the neat sketch of a slotting machine and mark all parts. (8)
- (b) List down the work holding devices of a planar. Sketch any two work holding services. (7)

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