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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

METALLURGY AND MACHINE TOOLS

[Maximum marks: 100] [Time: 3 Hours]

PART – A
Maximum marks: 10

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

1. Define the term space lattice.
2. Define machinability.
3. List any four types of drilling machines.
4. Name any four methods of indexing.
5. List any four slotting operations. (5 x 2 = 10)

PART – B
Maximum marks: 30

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

1. Explain the cooling curve for pure iron with the help of figure.
2. List the applications of powder metallurgy.
3. What are the desirable properties of a cutting tool material?
4. List the different work holding devices used in lathe.
5. Explain the following drilling operations.
   (a) Reaming (b) Boring (c) Counter boring
6. List the various shaper operations.
7. Differentiate between shaper and planer. (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) Explain iron-carbon equilibrium diagram with figure. (8)

(b) Explain the principle of strain hardening with figure. (7)

OR

IV. (a) Explain TTT diagram with figure. (8)

(b) Explain the advantages of powder metallurgy. (7)

UNIT – II

V. (a) Explain the different types of chips produced during metal cutting. (8)

(b) Sketch the line diagram of a lathe and label the parts. (7)

OR

VI. (a) Draw a single point cutting tool and mark its angles. (8)

(b) List the taper turning methods in lathe. Explain any two methods. (7)

UNIT - III

VII. (a) Sketch and show the various parts of a twist drill. (8)

(b) List the various milling operations. (7)

OR

VIII. (a) Sketch and label the parts of a radial drilling machine. (8)

(b) Explain up milling and down milling with figure. (7)

UNIT – IV

IX. (a) Explain the hydraulic system for quick return mechanism used in shapers. (8)

(b) Explain the working principle of planer with figure. (7)

OR

X. (a) Explain the Whitworth quick return mechanism for a shaper with figure. (8)

(b) Draw the sketch of a slotting machine and label its parts. (7)
