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TED (10) – 3039

Reg. No.

(REVISION—2010)

Signature

THIRD SEMESTER DIPLOMA EXAMINATION IN MECHANICAL
ENGINEERING — MARCH, 2015

METALLURGY AND MACHINE TOOLS

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A

(Maximum marks : 10)

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

1. Define space lattice.
2. What is the difference between Hypo eutectoid steel and Hyper eutectoid steel.
3. Define solid solution.
4. List taper turning methods used in Lathe.
5. What are the specifications of a Planer. (5x2=10)

PART—B

(Maximum marks : 30)

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

1. Explain crystal structures for metallic elements.
2. Draw a neat sketch of Blast furnace and mark all the parts.
3. What are the effects of alloying Ni and Cr in steel ?
4. Explain Austempering with the help of diagram.
5. What are the various types of chips, explain with figure ?
6. What are the specifications of a Lathe.
7. What are the advantages and disadvantages of Hydraulic system quick return mechanism. (5x6=30)

PART—C

(Maximum marks : 60)

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

UNIT – I

- III (a) Explain with sketches Slip and twinning. 7
 (b) Explain with sketch LD process of manufacturing steel. 8

OR

- IV (a) Describe dendritic solidification with the help of diagram showing various steps involved in formation of crystal. 8
 (b) With a diagram explain Open Hearth process. 7

UNIT – II

- V (a) Draw and explain Time Temperature Transformation (TTT) diagram. 7
 (b) Draw Iron Carbon Equilibrium diagram showing various phases and critical lines. 8

OR

- VI (a) Compare Annealing and Normalising. 7
 (b) Explain Nitriding and cyaniding. 8

UNIT – III

- VII (a) With a line sketch compare Orthogonal and Oblique cutting. 7
 (b) With an example explain the tool signature of a single point cutting tool. 8

OR

- VIII (a) Draw and explain the Back gear arrangement of Lathe. 8
 (b) What are the types of Drilling Machine ? Draw line sketch of sensitive drilling machine and mark parts. 7

UNIT – IV

- IX (a) Draw and explain automatic feed mechanism of Shaper. 8
 (b) Explain the work holding devices for Milling. 7

OR

- X (a) Draw and explain Crank and Slotted Liver Mechanism of Shaper. 10
 (b) Write any five comparison between Planer and Shaper. 5