Q.16 Explain the effects of grain size on the properties of metals.

Q.17 Explain Strain hardening.

Q.18 What are the properties and applications of High-Speed Steel

Q.19 Differentiate between Slip and twinning.

Q.20 Write a short note on Distortion and warping.

Q.21 Define Fatigue and Creep.

Q.22 What is Point Defect in solids? Explain its type.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Explain Iron Carbon Diagram with a neat sketch.

Q.24 Explain TTT- diagram with a neat sketch.

Q.25 Write short notes on

(a) Powder Metallurgy

(b) Procedure to control & prevent corrosion

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Roll No. .....

2nd Year / Advance Diploma in Tool & Die Making

Subject : Material Science and Heat Treatment

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Iron-carbon alloys containing carbon _____4.3 % are known as hyper-eutectic cast irons.

a) Equal to b) Less than

c) More than d) None of these

Q.2 Blast furnace produces following by reduction of iron ore

a) Cast iron b) Pig iron

c) Wrought iron d) Malleable iron

Q.3 Normalising of steel is done to

a) Refine the grain structure

b) Remove strains caused by cold working

c) Remove dislocations caused in the internal structure due to hot working

d) All of the above

Q.4 When steel containing less than 0.8 % carbon is cooled slow by from temperatures above or within the critical range, it consists of

a) Mainly ferrite

b) Mainly pearlite

c) Ferrite and pearlite

d) Pearlite and cementite

Q.5 Body centered cubic space lattice is found in

a) Zine, magnesium, cobalt, cadmium, antimony and bismuth

b) Gamma iron, aluminium, copper, lead, silver and nickel

c) Alpha iron, tungsten, chromium and molybdenum

d) None of the above

Q.6 Inspheroidising process, the steel is

a) Heated below the lower critical temperature and then cooled slowly

b) Heated up to the lower critical temperature and then cooled in still air.

c) Heated slightly above the lower critical temperature and then cooled slowly to a temperature of 600^0 C

d) None of the above

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 The process in which a portion of crystal takes orientation, which makes the portion a mirror image of the parent crystal is called_____.

Q.8 Deformation which disappears after the removal of load is called_____.

Q.9 The white cast iron contains carbon in the form of_____.

Q.10 The heat treatment process that produces hard surface by eddy currents is_____.

Q.11 The Hardest phase in the Iron Carbon system is known as_____.

Q.12 Very fast quenching of steel in water from austenite temperature forms _____.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Define space lattice and a unit cell.

Q.14 What is alloy steel? Why are alloying elements added to steel?

Q.15 Distinguish between substitutional and interstitial solid solution.