22449

23242

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define co-ordination number.

b) Define following -

i) Alloy

ii) Variable

c) State the characteristics of Ferrous Material.

d) List the advantages of carburizing.

e) State the meaning of 40Cr4Mo2.

f) List imperfection in crystal structure.

g) Draw Time - Temperature - Transformation diagram for eutectoid steel.

Marks

2. Attempt any THREE of the following: **12**

a) Explain with sketch the mechanism of crystalization.

b) Explain Hume Rothery Rule of substitutional solid solutions.

c) Draw crystal structure of FCC, BCC and HCP.

d) Discuss with neat sketch, types of point defects in crystals.

3. Attempt any THREE of the following: **12**

a) State Lever arm principle.

b) Explain cooling curve for pure metal with neat sketch.

c) Explain Gibb's phase rule.

d) Draw isomorphous system and explain it.

4. Attempt any THREE of the following: **12**

a) State the principle of heat treatment.

b) Distinguish between Annealing and Tempering.

c) Classify heat treatment processes.

d) Illustrate Solid carburizing process.

e) State applications of powder metallurgy.

5. Attempt any TWO of the following: **12**

a) Classify Engineering Materials.

b) Draw Iron-carbide equilibrium diagram and show various phases on it.

c) Write application, properties and composition of following materials.

i) Y-alloy

ii) Gun metal

iii) Babbit metal

Marks

6. Attempt any TWO of the following: **12**

a) List the properties of

i) Low Carbon Steel

ii) High Carbon Steel

b) Explain powder metallurgy process with major applications.

c) Write principle of Automization for powder manufacturing in powder metallurgy with neat sketch.

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