Scheme - I

Sample Question Paper

Program Name : **Diploma in Production Engineering / Production Technology**
Program Code : **PG /PT**
Semester : **Fourth**
Course Title : **Engineering Materials & Metallurgy**
Marks : **70** **Time: 3 Hrs.**

22449

Instructions:

(1) All questions are compulsory.

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following. **10 Marks**

a) Define unit cell & crystal structure.

b) Enlist two uses of equilibrium diagram.

c) Define allotropy.

d) State heat treatment process.

e) Write two applications of powder metallurgy.

f) Draw crystal structure of HCP.

g) State two applications of flame hardening process.

Q.2) Attempt any THREE of the following. **12 Marks**

a) Draw crystal structure of BCC & FCC. State packing factor of BCC & FCC structure.

b) Explain mechanism of crystallization.

c) Differentiate clearly between substitutional solid solution & interstitial solid solution.

d) Classify various imperfections of crystal & write two applications of imperfection in engineering.

Q.3) Attempt any THREE of the following. **12 Marks**

a) Explain Gibb's phase rule.

b) Describe procedure to draw binary equilibrium diagrams.

c) Draw isomorphous systems & explain.

d) Explain partial eutectic systems with neat sketch.

Q.4) Attempt any THREE of the following. 12 Marks

a) Draw TTT diagram for eutectoid steel.

b) Differentiate clearly between annealing & normalizing.

c) Explain carburising process of heat treatment.

d) Select heat treatment process for-

(i) Lathe bed hardening (ii) Gears of automobile

(iii) Shaft of automobile engine (iv) Stress relieving of crank shaft.

e) Explain importance & application of powder metallurgy process.

Q.5) Attempt any TWO of the following. 12 Marks

a) Draw Iron-Iron carbide equilibrium diagram & show all the phases in it. Write various reactions & equation for it.

b) Classify various types of alloy steel & give application of each.

c) Write composition, properties & application of

i) Magnesium alloy AZ31.

ii) Gun Metal.

iii) Muntz metal.

Q.6) Attempt any TWO of the following. 12 Marks

a) Explain composition & application of HSS.

b) Describe powder metallurgy process.

c) Classify various methods of powder making & explain their relative merits, demerits & application.

Scheme - I

Sample Test Paper - I

Program Name : **Diploma in Production Engineering / Production Technology**

Program Code : **PG /PT**

Semester : **Fourth**

22449

Course Title : **Engineering Materials & Metallurgy**

Marks : **20** **Time: 1 Hour.**

Instructions:

(1) All questions are compulsory.

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

a) Define unit cell & crystal structure.

b) Draw crystal structure of BCC.

c) Enlist two uses of equilibrium diagrams.

d) Explain dendrites.

e) Define allotropy.

f) Classify various ferrous metals.

Q.2 Attempt any THREE. **12 Marks**

a) Explain packing factor for BCC & FCC.

b) Describe Hume Rothery's rules for solid solution formation.

c) Explain lever arm principal and its uses.

d) Draw Iron-Iron carbide equilibrium diagram & show all the phases in it.

Scheme - I

Sample Test Paper - II

Program Name : **Diploma in Production Engineering / Production Technology**

Program Code : **PG /PT**

Semester : **Fourth**

22449

Course Title : **Engineering Materials & Metallurgy**

Marks : **20** **Time: 1 Hour**

Instructions:

(1) All questions are compulsory.

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

a) Explain purpose of heat treatment.

b) Define tempering.

c) List four advantages of composites.

d) Write two applications of powder metallurgy.

e) Explain the importance of designation & coding of metals.

f) Describe flame hardening process.

Q.2 Attempt any THREE. **12 Marks**

a) Explain composition and application of plain carbon steel.

b) Enlist four properties of copper & give two applications in industry.

c) Describe the powder metallurgy process.

d) Differentiate clearly between annealing & normalizing.