

**2025 / FYUG / ODD / SEM /
CHMIDC-201T / 463**

FYUG Odd Semester Exam., 2025

CHEMISTRY

(3rd Semester)

Course No. : CHMIDC-201T

(Heritage of Indian Metallurgy)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any *four* of the following as directed :

1×4=4

(a) What are minerals?

(b) Name one important ore of copper in sulphide form.

(2)

- (c) Brass is an alloy of _____ and _____
(Fill in the blanks)
- (d) Who is the father of metallurgy in India?
- (e) Mention which metal was first used by humans.

2. Answer any one of the following questions :

- (a) Distinguish between ores and minerals.
- (b) Why was copper often alloyed with tin in antiquity?

3. Answer any one of the following questions :

- (a) (i) Name any three metals of antiquity.
(ii) Name one metal used as currency in ancient India.
(iii) State one property of copper or gold.
(iv) Explain why these metals were considered as important.
(v) Discuss their roles in shaping early technological advancements.

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(3)

- (i) Mention two branches of metallurgy. 1
- (ii) Name one field where metallurgy is widely used. 1
- (iii) Explain why metallurgy is important for human development. 3
- (iv) Discuss its role in shaping early civilization. 3

UNIT—II

Answer any four of the following as directed : $1 \times 4 = 4$

- (a) Which technique did the Harappans use for creating intricate metal sculptures?
- (b) What is the primary purpose of the lost-wax technique in metallurgy?
- (c) Which element is added to copper to form bronze?
- (d) Name one Harappan site where bronze was used.
- (e) The Harappans did not know the use of (bronze/gold/iron/silver)
(Choose the correct option)

(Turn Over)

(4)

5. Answer any one of the following questions :

- (a) State two major applications of bronze in the Harappan period.
- (b) Which civilization is credited with laying the foundation for Indian metallurgy? Justify your answer.

1+1=2

6. Answer any one of the following questions :

- (a) (i) Name the earliest site where copper was found.
- (ii) State the approximate time period of copper use.
- (iii) Mention one object made of copper from that period.
- (iv) Explain how copper changed early human life.
- (v) Analyze its role in shaping early metallurgical practices.
- (b) (i) What is alloying?
- (ii) Name the two primary metals in bronze alloy.
- (iii) State the usual percentage range of tin in Harappan bronze.

(5)

(i) Explain why alloying was important for making bronze artefacts.

2

(ii) Evaluate the technological advancement shown by alloying in Harappan metallurgy.

3

UNIT—III

Answer any four of the following questions :

1×4=4

(a) What are the three classic 'coinage metals'?

(b) What was the unit of weight known as 'Ratti' used for in ancient India?

(c) Which ancient Indian coins were known for being die-struck?

(d) What is the general name for the process of producing coins?

(e) What is the 'copper hoard' culture?

Answer any one of the following questions :

2

(a) What is the primary reason countries have shifted from precious-metal currency to base-metal currency (fiat money)?

(b) Describe the significance of metallurgy in the development of Indian coinage.

(6)

9. Answer any one of the following questions :

- (a) (i) Define metallic currency.
(ii) Mention the earliest evidence of metallic currency in India.
(iii) Explain the role of the Indus Valley Civilization in the development of currency.
(iv) Describe the weight standards (Ratti and Satamana) used during this period.
(v) Discuss the importance of these early weight standards in trade and economy.

(b) (i) What role did Karshapana coins and Svarna coins play in ancient Indian economy? 2+2

(ii) How did they influence trade and commerce?

(iii) Compare the usage and significance of Karshapana coins and Svarna coins in ancient India.

(7)

UNIT—IV

Answer any four of the following questions : 1×4=4

- (a) Who is believed to have erected the iron pillar?
(b) What is Wootz steel?
(c) Name the purest form of iron.
(d) What are the primary applications of Wootz steel?
(e) Which other locations in India have ancient iron pillars known for their rust resistance apart from Delhi?

Answer any one of the following questions : 2

- (a) Mention some of the differences between wrought iron and steel.
(b) What is the mechanism behind the rust resistance of the iron pillar in Delhi?

Answer any one of the following questions : 8

- (a) (i) What is iron smelting? 1
(ii) Mention the raw material used in smelting. 1

(Turn Over)

(8)

- (iii) Name one region known for early iron smelting.
- (iv) Describe the basic steps of the process.
- (v) Discuss its impact on technology and trade.
- (b)
- (i) What is the chemical element responsible for steel hardness?
- (ii) State the approximate carbon content in steel.
- (iii) Mention one difference between low-carbon and high-carbon steel.
- (iv) Explain how carbon affects the properties of steel.
- (v) Evaluate its importance in the quality of Wootz steel.

UNIT—V

13. Answer any four of the following as directed :

1×4=

- (a) What do you mean by leaching?
- (b) Which ore is commonly used for extracting zinc?

(9)

The removal of silver and copper from gold is known as _____. (Fill in the blank)

In electrometallurgy, the metal is liberated at which electrode?

Which metal is used for making electrical contacts due to its high conductivity?

Answer any one of the following questions : 2

- (a) What are the properties of gold that make it valuable for various applications?
- (b) Discuss the role of zinc in protecting iron from corrosion.

15. Answer any one of the following questions : 8

- (a) (i) Name any one important ore of tin with chemical formula. 1
- (ii) Describe the steps involved in the extraction of tin from its ore. 5
- Give two applications of tin. 2

(Turn Over)

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- (b) (i) Explain the process of extraction of silver from its important ore.
- (ii) Write the approximate compositions and the uses of any *two* of the following alloys of silver :
- (1) Palladium-silver alloy
 - (2) Coinage alloy
 - (3) Copper-silver alloy

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