(c) Explain the biological significance of zinc metal, detailing its roles in various physiological processes and its importance for human health? (5,5,5)

5. (a) Explain how technetium-99m is utilized in imaging for the heart, brain, and bones?

(b) How do radiopharmaceuticals function in diagnostic imaging and therapeutic interventions?

(c) Elaborate on contrast agents used in MRI imaging and X-ray scan. What properties of Gd make it suitable for MRI imaging? (5,5,5)

6. Write short notes on (any **three**) :

(i) Megaloblastic anemia

(ii) Auranofin

(iii) Melarsoprol

(iv) De-nol (5,5,5)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5848 **H**

Unique Paper Code : 2174001210

Name of the Paper : GE: Role of Metals in Medicines

Name of the Course : **All Undergraduate Courses except with Chemistry Discipline**

Semester : II/IV

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **four** questions in all.
3. Each question carries **15** marks.

1. (a) Fill in the blanks.

(i) The metal _____ is essential for maintaining osmotic balance, nerve transmission, and muscle contraction in the human body.

(ii) _____ is a component of certain enzymes involved in nitrogen metabolism and has been found to be essential for the growth of certain bacteria.

(iii) _____ is a key component of bones and teeth, and it plays a vital role in muscle contraction, nerve transmission, and blood clotting.

(iv) _____ plays a crucial role in glucose metabolism by enhancing the action of insulin and is involved in the regulation of blood sugar levels.

(v) _____ is a component of vitamin B12, which is essential for DNA synthesis and neurological function.

(b) Elaborate on the significance of metals in biological systems? Outline the biological functions and sources of Molybdenum (Mo).

(c) Calcium is often referred to as the "building block" mineral in the human body. Describe its diverse biological functions. (5,5,5)

2. (a) Iron is an essential mineral for human health, playing a pivotal role in various physiological processes. Explain the dietary sources of iron and factors affecting its absorption in the body.

Also, describe the consequences of iron deficiency on human health, including the development of anemia.

(b) What are Diagnostic and therapeutic agents? Also, discuss the role of vanadium in the context of diabetes.

(c) Discuss the chemical structure, properties and mode of action of cis-platin as an anti-cancer medication? (5,5,5)

3. (a) Which lithium compound is utilized as a medication for depression? Discuss its mechanism of action and side effects?

(b) What are the chemical constituents and applications of calamine lotion and Alka-Seltzer?

(c) Which compound of bismuth is prescribed for peptic ulcers, and what are the potential adverse effects linked to its usage? (5,5,5)

4. (a) Discuss the chemical structure of cyanocobalamin including its physiological role, therapeutic uses and potential side effects?

(b) Elaborate on the function of sodium selenite in biological systems and discuss the adverse effects linked to its use?