3. Differentiate between the following (**any three**) :

$(3 \times 5 = 15)$

(a) Diffusion and dispersion

(b) Open and closed ecosystems

(c) Entropy And Enthalpy

(d) Water use efficiency and Water productivity

(e) Sedimentary rocks and Igneous rocks

4. (a) Explain the importance of greenhouse gasses in the Earth's atmosphere. (6)

(b) Methane is one of the most important anthropogenic greenhouse gasses on the Earth System. What is the major sink process for methane in the atmosphere? (9)

5. (a) Discuss why ozone is produced mainly in the equatorial regions and how it circulates around the Earth. (8)

(b) Why is ozone majorly restricted to the stratosphere in the Earth's atmosphere? (7)

6. Briefly describe the properties of thermal conductivity of the soil. Discuss how you can determine the soil temperature and thermal conductivity in different soil particle size fractions. (6+9=15)

Date- 01/03/2023 (M)

[This question paper contains 4 printed pages.]

Your Roll No...............

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.

2. Answer any **four** questions.

3. **All** Questions carry equal marks.

1. (a) Define (**Any five**) : $(2 \times 5 = 10)$

(i) Solar constant

(ii) Lapse rate

(iii) Transmittance

(iv) Radiant flux

(v) Convection

(vi) Greenhouse gasses

P.T.O.

(b) Multiple choice questions   (1×5=5)

  (i) A blackbody does not

    (a) emit radiation

    (b) absorb radiation

    (c) reflect radiation

    (d) refract radiation

  (ii) In a room containing air, heat can go from one place to another

    (a) By conduction only

    (b) By convection only

    (c) By radiation only

    (d) By all the three modes

  (iii) What process is used to form sedimentary rocks?

    (a) Lava cools and hardens to form a rock.

    (b) Bits of sand and gravel form layers that turn into rock from pressure.

    (c) Extreme heat and pressure from inside the Earth turn rocks into new rocks.

    (d) Magma trapped under the Earth's surface cools and solidifies.

  (iv) Which of the following pairs of physical quantities may be represented in the same unit?

    (a) Heat and work

    (b) Temperature and mole

    (c) Heat and temperature

    (d) Specific heat and heat

  (v) When a hot liquid is mixed with a cold liquid, the temperature of the mixture

    (a) First decreases, then become constant

    (b) First increases then become constant

    (c) Continuously increases

    (d) Is unidentified for some time and then becomes nearly constant

2. Write short notes on the following (**any three**) :

                                  (5×3=15)

(a) Darcy's law

(b) Solar electromagnetic radiation

(c) Volatile organic compounds

(d) Liquid-vapor phase transition

(e) Isothermal process