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MIO–005

DIPLOMA IN SMART CITY DEVELOPMENT AND MANAGEMENT (DSCDM)

Term-End Examination

June, 2024

MIO-005 : SMART CITIES : SAFE WATER, SANITATION AND SUSTAINABILITY

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Attempt any **seven** questions.*

(ii) All questions carry equal marks.

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1. (a) Explain briefly the role of Artificial Intelligence (AI) in making a smart city. 4

   (b) What are the uses of smart water metering ? 3

   (c) Write the uses of water quality monitoring in terms of smart city management. 3

2. (a) Explain the various processes used in advanced water treatment. 7

(b) What are the factors considered in installing a treatment process ? 3

3. (a) Explain the conservancy system and mention its advantages for waste collection. 4

(b) Describe the characteristics of untreated sewage in brief. 6

4. (a) Explain engineering aspects to be considered while planning and designing a sewage system. 6

(b) Discuss circular economy in waste water treatment plants. 4

5. (a) Classify different types of composting system. 4

(b) Explain the steps involved in aerobic digestion. 6

6. (a) Write the primary functions of RDF systems. 3

(b) What are the end products of paralysis ? 3

(c) How can sustainable development be implemented in ISWM ? 4

7. (a) What are the different types of bio-fuels that can be obtained from solid waste ? 4

(b) Explain briefly the advanced treatment methods used in the treatment of solid waste. 6

8. (a) What is biohydrogen ? Discuss the process of conversion of waste to biohydrogen. 5

(b) Write the difference between dumping and landfill. 3

(c) What is leachate in solid waste landfill ? 2

9. (a) Define the value-added product. What are the reasons for developing value-added products ? 5

(b) Discuss the different types of wastes utilized in emerging value-added products. 5

10. Write short notes on any *four* of the following : $4 \times 2\frac{1}{2} = 10$

(a) Bioflocculants

(b) Volatile Fatty Acids (VFAs)

(c) Concrete Slurry Waste

(d) Crushed Brick Waste

(e) Water Smart Meter