

**DSCDM- July 2024**

**ASSIGNMENT BOOKLET**

**DIPLOMA IN SMART CITY DEVELOPMENT  
AND MANAGEMENT (DSCDM)**

**Last date for submission: For July 2024 Batch**

**30<sup>th</sup> April 2025**



**School of Engineering and Technology  
Indira Gandhi National Open University  
Maidan Garhi, New Delhi-110068**

Dear Student,

We advise you to go through your course material carefully and read all the section pertaining to assignments. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation which would consist of **one tutor-marked assignment** for each of MIO-001, MIO-002, MIO- 003, MIO-004 and MIO-005 of these courses. You must score a minimum of 40 marks out of 100marks in each of the assignments. Submit your assignment response at Your **Study Centre** or **Programme Coordinator (DSCDM), Block-C, School of Engineering & Technology, Indira Gandhi National Open University, Maidan Garhi, New Delhi - 110068**

### Instructions for Formatting Your Assignments

Before attempting the assignment, please read the following instructions carefully.

- 1) On top of the first page of your Tutor Marked Assignment (TMA) answer sheet, please write the details exactly in the following format:

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**ENROLMENT NO:** .....

**NAME:** .....

**ADDRESS:** .....

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**COURSE CODE:** .....

**COURSE TITLE:** .....

**ASSIGNMENT CODE:** .....

**STUDY CENTRE:** SOET, IGNOU Campus                      **DATE:** .....

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**PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.**

- 2) Use only full-size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) While solving problems, clearly indicate the question number along with the part being solved. Be precise. Recheck your work before submitting it.

Answer sheets received after the due date shall not be accepted.

**We strongly feel that you should retain a copy of your assignment response to avoid any unforeseen situation and append, if possible, a photocopy of this booklet with your response.**

We wish you good luck.

## Assignment -1

(To be done **after** studying the course material)

Course Code: MIO-001

Course Title: Introduction to Smart Regions: Smart Cities and Smart Villages

Assignment Code: MIO-001/TMA/2024

Maximum Marks: 100

### Note:

- 1. In any question, whenever we ask you to suggest an activity, we expect you to give one other than those covered in the units**
  - 2. For any question worth 5 marks the word limit is 200 words, for a 10-mark question it is 350 words.**
  - 3. All questions are compulsory. All questions carry equal marks.**
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Q.1	Define a formal Region? What are the techniques employed to delineate a functional region?	10
Q.2	a) What are the factors of production? What is oligopoly?	5
	b) What are the different forms of markets? What are the essentials of a market?	5
Q.3	What are the three pillars of sustainability? How many sustainable goals have been adopted by the UN General assembly for 2030?	10
Q.4	a) Define smart city. What do you understand by Smart City? What are the Key Features of Smart City?	5
	b) What are the objectives of Smart City? Explain different layers of a Smart City?	5
Q.5	a) What are the different types of surveys? What do you mean by sampling?	5
	b) What are the core principles of a Smart infrastructure? How can IoT helps in detecting water leakages?	5
Q.6	a) Elaborate on the application of IoT in Smart Waste Management. List the advantages of Integrating Smart Waste Management in Cities?	5
	b) What are the advantages of Intelligent Transportation Systems offer in a Smart City. Elaborate on application of the IoT in Intelligent Transportation Management.	5
Q.7	a) Define rural development. What are the various components of rural development?	5
	b) Define Smart Villages? What are the main characters of Smart Villages? Why do we need Smart Villages in context of rural India?	5
Q.8	What are the main problems with respect to provision of sanitation facilities in rural India? Explain the provisions and progress of the Swachh Bharat Mission, Gramin.	10

- Q.9 a) What is Governance? What is its importance? Explain the role of Smart Cities in Governance 5
- b) Define Public Policy. What are its characteristics? List out and explain the characteristics of Public Policy. 5
- Q.10 a) What are the strategic components of area-based development in Smart City Mission? 5
- b) What is Clean Water Act? Explain Safe Drinking Water Act. Discuss in brief about European Legislation in water quality. 5

## Assignment -2

(To be done **after** studying the course material)

Course Code: MIO-002

Course Title: Smart Technologies (Hardware and Software)

Assignment Code: MIO-002/TMA/2024

Maximum Marks: 100

### Note:

1. In any question, whenever we ask you to suggest an activity, we expect you to give one other than those covered in the units
  2. For any question worth 5 marks the word limit is 200 words, for a 10-mark question it is 350 words.
  3. All questions are compulsory. All questions carry equal marks.
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Q.1	How is Internet of Things (IoT) playing a key role in protecting the environments?	10
Q.2	What is Internet of Everything (IoE)? Discuss the application of IoE in Supply Chain Management.	10
Q.3	What do you understand by Smart Grid? Explain. Also compare existing grid with future grid.	10
Q.4	Discuss the concept of Blockchain Technology. Explain the working of Blockchain Technology giving an example.	10
Q.5	Discuss the application of Blockchain Technology in Trade Finance.	10
Q.6	What do you understand by Monte Carlo Tree Search? Explain.	10
Q.7	a) Briefly describe the Iterative K-means clustering algorithm?	5
	b) What is perceptron? Explain.	5
Q.8	a) Discuss the applications of Sensors in Smart Cities.	5
	b) Discuss the applications of Actuators in Smart Cities.	5
Q.9	What is SCADA? Discuss the Architecture of SCADA and Its applications.	10
Q.10	What is AI and ML? Explain the various applications of AI and ML in Healthcare.	10

### Assignment -3

(To be done **after** studying the course material)

Course Code: MIO-003

Course Title: Smart Urban Energy Systems and Smart Transportation Systems

Assignment Code: MIO-003/TMA/2024

Maximum Marks: 100

#### Note:

- 1. In any question, whenever we ask you to suggest an activity, we expect you to give one other than those covered in the units**
  - 2. For any question worth 5 marks the word limit is 200 words, for a 10-mark question it is 350 words.**
  - 3. All questions are compulsory. All questions carry equal marks.**
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|-----|----|----------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q.1 | a) | What is Solar Energy? Explain briefly the ways to produce solar energy.                                                                      | 5 |
|     | b) | What are the applications of Solar Energy in smart cities? Support your answer with the example of any city.                                 | 5 |
| Q.2 | a) | What are the core objectives of smart storage mission? Explain the components of smart storage technologies.                                 | 5 |
|     | b) | What is smart lighting? Describe the goals and advantages of smart lighting.                                                                 | 5 |
| Q.3 | a) | Define Smart Grid and Micro-Grid. How does a smart meter work in smart grid infrastructures?                                                 | 5 |
|     | b) | What is SCADA? How does the smart grid work under SCADA? Support your answer with a schematic network.                                       | 5 |
| Q.4 | a) | Explain the characteristics and advantages of metro rail system.                                                                             | 5 |
|     | b) | What are the different technologies used for Automatic Vehicle Identification System?                                                        | 5 |
| Q.5 | a) | What is Integrated Traffic Control System? Explain the application of CCTV based surveillance system.                                        | 5 |
|     | b) | What is the need for electric vehicles in the present situation of the entire world? How can ITS accelerate the growth of electric vehicles? | 5 |
| Q.6 | a) | What are the various types of electric vehicle system? Differentiate between battery and hybrid electric vehicle systems.                    | 5 |
|     | b) | What is the kind of charging Infrastructure of Electric Vehicles? How a wireless charging system works for electric vehicles?                | 5 |
| Q.7 | a) | What do you understand about connected vehicles? What are the features of connected vehicles?                                                | 5 |
|     | b) | Define Autonomous Vehicles. Describe the challenges of Autonomous Vehicles.                                                                  | 5 |
| Q.8 | a) | Define the term Big-Data. Explain the application of Big-Data in Transportation sector.                                                      | 5 |
|     | b) | Define IoT. How IoT and Big-Data can be utilized in providing better services to users in the transport sector.                              | 5 |

- Q.9 a) What are the different aspects where an ITS can be applied in the domain of road safety? 5
- b) What is smart mobility? How is it facilitating the last-mile connectivity? 5
- Q.10 a) What is the status of EV's in India? What are the challenges for adoption of EV's in India? 5
- b) Describe the need and plan of Integrated Multi Model Transport System (IMMTS) for a city like Delhi and Mumbai. 5

#### Assignment -4

(To be done **after** studying the course material)

Course Code: MIO-004

Course Title: Smart Health Education Governance and Cyber Security

Assignment Code: MIO-004/TMA/2024

Maximum Marks: 100

#### Note:

- 1. In any question, whenever we ask you to suggest an activity, we expect you to give one other than those covered in the units**
  - 2. For any question worth 5 marks the word limit is 200 words, for a 10-mark question it is 350 words.**
  - 3. All questions are compulsory. All questions carry equal marks.**
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|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------|----|
| Q.1 | a) | Discuss the importance of Urban Planning. Explain different types of Smart Cities development.                                                | 5  |
|     | b) | Differentiate between traditional and Smart buildings. Explain any Five Smart building services.                                              | 5  |
| Q.2 | a) | What is the difference between wireless and wired security Camera?                                                                            | 5  |
|     | b) | What is Digital Command and Control Centre? How have the Integrated Command and Control Centre helped in city management during the pandemic? | 5  |
| Q.3 | a) | Why is digital healthcare required, particularly in developing countries?                                                                     | 5  |
|     | b) | What is the need of emerging technologies in smart healthcare systems?                                                                        | 5  |
| Q.4 | a) | What is smart home? How does it function? What are the advantages and disadvantages of smart homes?                                           | 5  |
|     | b) | What are the issues and opportunities in smart health? Explain Individual Privacy in smart health.                                            | 5  |
| Q.5 |    | What is smart education system? What are different mediums of smart education? Explain the various challenges of online education.            | 10 |
| Q.6 |    | Describe the importance of Smart education. Explain the schemes present in NEP for smart education.                                           | 10 |
| Q.7 | a) | What do you understand about Governance? Explain the difference between e-Government and e-Governance.                                        | 5  |
|     | b) | What do you understand by smart factory? How is Industry 4.0 impacting public service delivery process in India?                              | 5  |
| Q.8 | a) | What are the different cybercrimes that are acting as challenges in smart governance?                                                         | 5  |
|     | b) | Capacity building is a challenge in Smart Governance process. Explain.                                                                        | 5  |
| Q.9 | a) | What are the different aspects where an ITS can be applied in the domain of road safety?                                                      | 5  |
|     | b) | Define IT act and its amendment. What are the different initiatives taken by Government of India for protecting country's information assets? | 5  |



- Q.10 a) What are the trends in cyber security? Why are outdated systems becoming easy targets for hackers? 5
- b) What do you understand about Cryptocurrency and Big Data? What is the need to adopt the latest cyber security technologies? 5

## Assignment - 5

(To be done **after** studying the course material)

Course Code: MIO-005

Course Title: Smart Cities: Safe Water, Sanitation and Sustainability

Assignment Code: MIO-005/TMA/2024

Maximum Marks: 100

### Note:

1. In any question, whenever we ask you to suggest an activity, we expect you to give one other than those covered in the units
  2. For any question worth 5 marks the word limit is 200 words, for a 10-mark question it is 350 words.
  3. All questions are compulsory. All questions carry equal marks.
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|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q.1 | a) | What are the sources of clean water? Discuss the major issues in smart water supply                                                                   | 5 |
|     | b) | What is the fourfold path to be followed to meet the demand for potable water supply?                                                                 | 5 |
| Q.2 | a) | What are the principles to be followed in order to meet the water demand?                                                                             | 5 |
|     | b) | What are the steps to be taken to counter the threat conditions of water supply.                                                                      | 5 |
| Q.3 | a) | What is water monitoring? What are the uses of water quality monitoring?                                                                              | 5 |
|     | b) | What is SCADA System? What are its uses in water management?                                                                                          | 5 |
| Q.4 | a) | What are the objectives of treating water? Discuss the various types of processes used in advanced water treatment.                                   | 5 |
|     | b) | What is settling velocity? What are the various types of settling in sedimentation tank?                                                              | 5 |
| Q.5 | a) | What is the purpose of planning and designing a sewage collection scheme?                                                                             | 5 |
|     | b) | Describe broad characteristics of the untreated sewage giving examples.                                                                               | 5 |
| Q.6 | a) | Explain the steps involved in the planning and design of sewerage system.                                                                             | 5 |
|     | b) | List out various design considerations related to the setting up of a sewerage system.                                                                | 5 |
| Q.7 | a) | Explain the need of solid waste management. State the problems occurred due to improper solid waste management?                                       | 5 |
|     | b) | What are the different sources of the municipal solid waste generation? Explain the factors affecting the rate of municipal solid waste generation.   | 5 |
| Q.8 | a) | What are the different types of solid waste collection systems? What are the necessary steps to be taken while establishing a waste storage facility? | 5 |
|     | b) | What are the different chemical technologies in waste management? Explain the advanced treatment methods used in the treatment of solid waste.        | 5 |
| Q.9 | a) | What are the stages for the selection of landfill site and write the steps involved in each stage?                                                    | 5 |

- b) What is the emerging value-added products? Discuss the different types of waste utilized in emerging value-added products. 5
- Q.10 a) What are the different waste materials, which could be used as construction materials? 5
- b) Describe bio-ethanol production process. What are the benefits of using bio-ethanol as a fuel? 5