DSCDM JANUARY - 2025

ASSIGNMENT BOOKLET

Diploma in Smart City Development and Management

(DSCDM)

Last date for submission:

30th October 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 units 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 need to score a minimum of 40 marks out of 100 marks in each of the assignments. **Submit the handwritten assignments to Programme Coordinator, DSCDM, Room No.104, Block-C, SOET, IGNOU Campus, Maidan Garhi, New Delhi-68.**

Instructions for Formatting Your Assignments

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

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

ENROLMENT NO: .....

NAME: .....

ADDRESS: .....

.....

COURSECODE: .....

COURSETITLE: .....

ASSIGNMENT NO.: .....

STUDYCENTRE: ..... **DATE:** .....

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) Only handwritten assignments acceptable. No typed assignments

6) 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/2025
Maximum Marks: 100

Note:

1. Attempt all questions. All questions carry equal marks.

Q.1	Define a formal Region. Discuss the techniques employed to delineate a functional region?	10
Q. 2	a) Discuss the changing pattern of Indian Society?	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	What are the objectives of Smart City? Explain different layers of a Smart City.	10
Q. 5	What are the core principles of a Smart Infrastructure? How can IoT helps in detecting water leakages?	10
Q. 6	a) Elaborate on the application of IoT in Smart Waste Management.	5
	b) What are the advantages of Intelligent Transportation Systems offer in a Smart City.	5
Q. 7	Define rural development. What are the various components of rural development?	10
Q. 8	Define Smart Villages? What are the main characters of Smart Villages? Why do we need Smart Villages in context of rural India?	10
Q. 9	What are the main problems with respect to provision of sanitation facilities in rural India?	10
Q. 10	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

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/2025
Maximum Marks: 100

1. Attempt all questions. All questions carry equal marks.

Q. 1	Define IoT. Explain the different characteristics of IoT. Discuss the benefits of IoT.	10
Q. 2	Define IIoT and IoE. Discuss few applications of IoE.	10
Q. 3	What is Smart Grid? What are the different components of smart grid? Explain with a neat diagram.	10
Q. 4	What is Blockchain Technology? Explain the evaluation of blockchain technology. Discuss the impact of blockchain technology in the financial sector.	10
Q. 5	Discuss in detail, various applications and benefits of blockchain technology in healthcare sector with suitable examples.	10
Q. 6	What is AI? Discuss different applications of AI. Also discuss biases in AI.	10
Q. 7	Briefly describe the various AI and ML challenges in key components of Smart Cities.	10
Q. 8	What is a sensor? How do you classify sensors? Discuss various sensor applications in Smart Cities.	10
Q. 9	What is Data Science and Big Data? Discuss the different characteristics of Big Data. Explain different applications of Big Data in Smart Cities.	10
Q.10	What is SCADA? Explain the function of ‘Host SCADA’. Discuss data flow, data processing and tagging in SCADA.	10

Assignment -3
(To be done after studying the course material)

Course Code: MIO – 003
Course Title: SMART URBAN ENERGY AND SMART TRANSPORTATION SYSTEMS
Assignment Code: MIO – 003/TMA/2025
Maximum Marks: 100

1. Attempt all questions. All questions carry equal marks.

Q.1	(a) Discuss the various applications of solar energy in a Smart City.	5
	(b) Explain the goals of smart lighting in brief.	5
Q. 2	(a) Discuss the concept of Prognostics in Energy Management Systems.	5
	(b) Explain the smart grid electricity distribution system, with the help of a neat sketch.	5
Q. 3	(a) What is BRT? Explain the principles to be followed in developing BRT system.	5
	(b) Discuss the various stages of Intelligent Transportation planning in detail.	5
Q. 4	(a) Explain the centralized traffic control and monitoring system.	5
	(b) Discuss the features of Connected Vehicles.	5
Q. 5	(a) Discuss the challenges of an Autonomous Vehicle.	5
	(b) Define IoT and explain its application in transportation sector.	5
Q. 6	(a) Write a detailed study on Smart Transportation System	5
	(b) Explain Solar Photovoltaic System.	5
Q. 7	(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. 8	(a) Distinguish between Smart grid and Micro grid.	5
	(b) Differentiate between Battery Electric Vehicle and Hybrid Electric Vehicle.	5
Q. 9	(a) Explain Automated Parking. How Automated Parking is done in a Smart City.	5
	(b) Explain Vehicle Tracking System in a Smart City.	5
Q. 10	Write short notes on the following: (a) Vehicle Diagnostics Analysis (b) Biomass Energy	5+5=10

Assignment -4
(To be done after studying the course material)

Course Code: MIO – 004
Course Title: Smart Cities: Health, Education, Governance and Cyber Security
Assignment Code: MIO – 004/TMA/2025
Maximum Marks: 100

1. Attempt all questions. All questions carry equal marks.

Q.1	(a) Differentiate between Traditional and Smart Buildings. Explain any five Smart Building services.	5
	(b) Discuss any five key challenges of Smart Cities.	5
Q. 2	(a) What are digital command and control centers? How can integration of command-and-control centers help in city management during a pandemic?	5
	(b) Write any five advantages and disadvantages of smart building.	5
Q. 3	(a) What is the need of emerging technologies in smart health care systems? Explain.	5
	(b) Explain the Robotic Process Automation, with a suitable example.	5
Q. 4	Explain any five characteristics of a smart health care system.	5
	Explain individual privacy in smart health. What are the issues and opportunities in smart health?	5
Q. 5	(a) Discuss the various services and benefits of e-health and m-Health.	5
	(b) What are the uses of Natural Language Processing (NLP) in health care system? Explain Briefly.	5
Q. 6	(a) What are Home Health Platforms and Smart Home Services? Explain	5
	(b) How does a Smart home works? What are the various functions of a smart Home?	5
Q. 7	(a) What is Nanomedicine? How does Nanomedicine work?	5
	(b) What are the various initiatives of Government of India in Smart health care?	5

Q. 8	(a) Discuss the various opportunities and challenges of online education.	5
	(b) Describe the importance of Smart Education. Discuss the various schemes present in National Education Policy (NEP – 2020) for Smart Education.	5
Q. 9	(a) Define cyber space. Explain the common cybercrime techniques briefly.	5
	(b) What do you understand by smart factory? How does a smart factory differ from a traditional factory? Explain briefly.	5
Q. 10	Write short notes on the following: (a) e-Governance (b) IT Act (c) Machine Learning (d) Emerging Educational Technologies	10

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/2025
Maximum Marks: 100

1. Attempt all questions. All questions carry equal marks.

Q.1	(a) Mention the water quality standards for clean and safe drinking water.	5
	(b) Discuss the major issues in Smart City water supply.	5
Q. 2	(a) Discuss the smart solutions for water management in Smart Cities	5
	(b) What are the vulnerability assessment elements in the water supply system?	5
Q. 3	(a) What is SCADA system? Describe its uses in water management.	5
	(b) Discuss various factors that are considered in water quality program designing.	5
Q. 4	(a) Discuss the purpose of advance water treatment and the techniques used in advance water treatment.	5
	(b) Draw the flowcharts of water treatment plant for surface water and ground water.	5
Q. 5	Discuss various types of sewerage systems.	10
Q. 6	(a) Discuss various factors affecting the quantity of dry weather flow.	5
	(b) Enlist various methods for determination of quantity of sanitary sewage. Discuss anyone in detail.	5
Q. 7	(a) Draw the generalized flow diagram of sewage treatment system.	5
	(b) Discuss the advanced sewage treatment processes.	5
Q. 8	(a) Discuss the physical and chemical characteristics of solid waste.	5

	(b) Discuss biological processing methods of solid waste.	5
Q. 9	(a) Discuss various solid waste conversion technologies in brief.	5
	(b) Describe the design parameters which are considered while planning the landfill.	5
Q. 10	(a) Discuss the problems associated with conventional value-added products.	5
	(b) What are bio fertilizers? Describe the types of bio-fertilizers and their benefits.	5

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