

DSCDM
July- 2022

ASSIGNMENT BOOKLET

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

Last date for submission:

31th May 2023



**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 have to score a minimum of 40 marks out of 100 marks in each of the assignments. Submit your assignment response at **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:

ENROLMENT NO:

NAME:

ADDRESS:

.....

.....

COURSE CODE:

COURSE TITLE:

ASSIGNMENT CODE:

STUDY CENTRE: SOET, IGNOU Campus

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) 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/2022

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. Who gave the concept of Garden City? What are the techniques employed to delineate a functional region? (10)
- Q. 2 (a) Discuss the major elements of Indian Culture. (5)
(b) Discuss the changing pattern of Indian Society. (5)
- Q. 3 Describe the concept and types of Micro and Macro Economics in detail. (10)
- Q. 4 (a) What do you understand about Energy Efficiency? Why do we call a city as Energy efficient city? (5)
(b) What do you understand about Resident Cities? Explain the characteristics of a resident city. (5)
- Q. 5 (a) What is smart city? What are the components of infrastructures needed for a smart city? (5)
(b) What kind of smart solutions are needed for a smart city? (5)
- Q. 6 (a) What do you understand by Smart Water management? Explain the use of IOT applications for Smart Water Management. (5)
(b) What is smart Waste Management? List its advantages. Explain the use of IOT applications for smart waste management. (5)
- Q. 7 (a) What is smart Energy Management? List the benefits of smart energy management. Explain the use of IOT application in smart Energy management. (5)
(b) What do you understand by ICT's in Smart cities? Describe the role of ICT Infrastructure in Smart Cities. (5)
- Q. 8 (a) Define Smart Villages. What are the main characteristics of smart villages? What role does innovation play in developing smart villages? (5)
(b) 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. (5)
- Q. 9 (a) What is the concept of digital India? Elaborate on the following: (5)

(i) Digital Empowerment of Citizens.

(ii) Universal Digital Literacy.

(b) Define Public Policy. What are its characteristics? Describe the policy principles for smart cities. (5)

Q. 10 (a) What are the major roles of Waste water in cities, industries and agriculture? (5)

(b) What is the UN Global waste water initiative? What are the expected outcomes of this initiative? (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/2022

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 Explain in detail the applications of the Internet of Things (IoT) in home automation. (10)
- Q. 2 Explain different layers of “Industrial Internet of Things (IIoT)” architecture. (10)
- Q. 3 What are various energy storage technologies? Discuss a few applications of energy storage technologies. (10)
- Q. 4 Explain pharmaceutical supply chain management that uses blockchain with a suitable diagram. (10)
- Q. 5 Explain the applications of AI in the domain of speech recognition and natural language processing. (10)
- Q. 6 Explain linear and logistic regression with examples. (10)
- Q. 7 Explain the applications of AI and ML in mobility and transportation. (10)
- Q. 8 Write in detail about classifications of sensors and actuators. (10)
- Q. 9 Explain the role of data analytics in smart city development and management. (10)
- Q. 10 Define the following terms: (10)
- a. SCADA
 - b. Remote Terminal Unit (RTU)
 - c. Historical Data Recording (HDR)
 - d. Geographical Information System (GIS)
 - e. Management Information Systems (MIS)

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/2022

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 Enlist various applications of solar energy in smart cities and explain any one of them in detail. (10)
- Q.2 Discuss the utility of battery storage in smart city. Also write the limitations/obstacles in the development of battery storage system. (10)
- Q.3 Describe TELMA with the help of a neat diagram of its structure. (10)
- Q.4 Discuss the significance of SCADA in energy transmission. (10)
- Q.5 What is monorail? How is different from Metro rail? (10)
- Q.6 Discuss Bluetooth Beacon Technology in detail. (10)
- Q.7 Do we really need EVs? Justify your answer for the global situation. (10)
- Q.8 (a)What are the features of Connected Vehicles? (10)
- (b)How the vehicle infotainment system makes the travel comfortable for users? (10)
- Q.9 Differentiate between the following: (10)
- (a) Connected vehicles and Autonomous Vehicles
- (b) Pumped hydro energy storage and compressed air energy storage
- Q.10 Write short notes on the following (10)
- (a) IoT application in transportation system
- (b) GPS
- (c) Bioenergy
- (d) Smart grid

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/2022

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 the role of emerging technologies in the development of smart cities? (5)
- (b) What are the various initiatives taken by Government of India in Covid times for smart cities? (5)
- Q.2 (a) What is key difference between smart and traditional buildings? (5)
- (b) What are the components in a security camera? Also explain uses of security camera. (5)
- Q.3 (a) How can robotics be used for digital transformation in the urban context?(5)
- (b) What are the concerns related to RAS technologies? (5)
- Q.4 (a) How can emerging technologies help in smart health systems? Explain with suitable examples. (5)
- (b) What the characteristics and requirements of smart health care system ? (5)
- Q.5 (a) What are the uses of NLP in Health care system ? Explain. (5)
- (b) Differentiate between Tele-medicine and Cyber-medicine. (5)
- Q.6 (a) What is ERM and what is the need for it? (5)
- (b) What are advantages and disadvantages of Smart Homes? (5)
- Q.7 (a) What are the concerns and trends related is Smart Health? (5)
- (b) What is Nano-medicine and how is it been used? (5)
- Q.8 (a) Describe Blockchain Technology and its role in Smart Education. (5)
- (b) What are different challenges of online education? (5)
- Q.9 (a) What are the four aspects of smart education to complete the needs of Individual student? (5)
- (b) Explain the concept of Blended Learning. (5)
- Q.10 (a) What are the different challenges in imparting Smart Education? Explain (5)
- (b) Discuss the approaches and considerations of Web-based learning. (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/2022

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 major issues in the smart city water supply? (5)
(b) Write the uses of Smart Water Network (SWN). (5)
- Q.2. (a) What are the four-fold paths to be followed to meet the demand for potable water supply? (5)
(b) Explain five-layer model of SWAN. (5)
- Q.3. (a) What are the principles to be followed in order to meet the water demand? (5)
(b) What is SCADA system? What are its uses in water management? (5)
- Q.4. (a) What is the purpose of screening and what are the different types of screens used? (5)
(b) Explain how refuse is carried in water carriage system. (5)
- Q.5. (a) Explain the factors affecting the rate of municipal solid waste generation? (5)
(b) What are different types of solid waste collection systems? (5)
- Q.6. (a) Define composting and the factors that affect composting process. (5)
(b) How refuse derived fuel (RDF) is generated? (5)
- Q.7. (a) How sustainable development can be implemented in ISWM? (5)
(b) How the biogas can be extracted from landfills? Explain how to manage the biogas obtained from landfills without affecting the environment. (5)
- Q.8. What is bio-hydrogen? Discuss the process of conversion of waste to bio hydrogen. (5)
- Q.9. (a) What are the different types of wastes utilized in emerging value-added products? (5)
(b) Write a note on the optimum replacement of construction materials by waste materials in construction. (5)

- Q.10. (a) What are the advantages and disadvantages of bio-pesticides? (5)
- (b) Explain bio-ethanol production. (5)