**ASSIGNMENT BOOKLET**


# CERTIFICATE IN SMART CITY DEVELOPMENTAND MANAGEMENT (CSCDM)


**Last date for submission: 30th October 2022**


**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 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 (CSCDM), 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/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**
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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)

**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

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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.**

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)