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MIO-002

**DIPLOMA/CERTIFICATE IN SMART
CITY DEVELOPMENT AND
MANAGEMENT (DSCDM)/(CSCDM)**

Term-End Examination

December, 2023

**MIO-002 : SMART TECHNOLOGIES (HARDWARE
AND SOFTWARE)**

Time : 3 Hours

Maximum Marks : 70

Note : *Answer any seven questions. All questions carry equal marks.*

1. (a) Explain Internet of Things (IoT) in the context of smart cities. 5
(b) Discuss *three* major application areas of the Internet of Things (IoT). 5

2. What is the Fourth Industrial Revolution (Industry 4.0) ? Discuss a few critical components of the Industrial Internet of Things (IIoT). 10

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3. (a) Explain Peak Load Management in a Smart Grid System. 5
(b) Write and explain any *two* energy storage technologies. 5
4. What is Block Chain Technology ? Write and explain various components of block chain technology for implementation. 10
5. (a) What are the key areas in smart cities where applications of block chain technology can be used ? 5
(b) Discuss the challenges of applying block chain technology to smart city applications. 5
6. (a) What do you understand by ‘Supervised learning’ and ‘Reinforcement learning’ ? 5
(b) How is ‘reinforcement learning’ different from ‘supervised learning’ ? 5
7. Discuss the role of Artificial Intelligence (AI) and Machine Learning (ML) in energy sector. Elucidate your answer with examples of ‘power generation forecast of renewable energy’ and ‘analysis of consumer electricity consuming behaviour’. 10

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8. (a) Explain the role of a sensor in a smart city with a suitable application. 5
- (b) What is Actuator ? Write and explain Actuator applications in a smart city. 5
9. Define Big Data. Explain the evolution of Big Data and its characteristics with a suitable example. 10
10. What do you understand by SCADA system ? Explain the hardware architecture of SCADA. 10