GUJARAT TECHNOLOGICAL UNIVERSITY

BE 7 SEMESTER – OLD PAPER – S22 TO S26 – QUESTION BANK

Subject Name & Code: Infrastructure for smart Cities - 3170628

Chapter 1: Fundamental of smart city & Infrastructure

Repeated Questions:

1. Concept, Objectives and Features of Smart Cities:

- **Q.** Explain the concept of Smart City and requirements of Smart Cities. **(SUMMER 2022, 7 Marks; WINTER 2022, 7 Marks; SUMMER 2025, 3 Marks; WINTER 2025, 3 Marks; SUMMER 2026, 3 Marks)**
- **Q.** Discuss various objectives/goals of smart cities. **(SUMMER 2022, 3 Marks; WINTER 2022, 3 Marks; SUMMER 2023, 3 Marks; WINTER 2023, 3 Marks; SUMMER 2024, 3 Marks; SUMMER 2026, 4 Marks)**
- **Q.** Describe the features of smart cities. **(SUMMER 2022, 4 Marks; SUMMER 2024, 4 Marks)**

2. Benefits, Challenges and Smart City Challenge:

- **Q.** Evaluate the benefits and challenges associated with the development of Smart Cities in India. / Give advantages and disadvantages of Smart Cities. / Give smart city challenges and its measures in Indian context. **(SUMMER 2022, 7 Marks OR; WINTER 2022, 4 Marks; WINTER 2022, 7 Marks OR; SUMMER 2023, 7 Marks; WINTER 2023, 7 Marks; SUMMER 2024, 7 Marks OR; WINTER 2024, 7 Marks; WINTER 2025, 7 Marks)**
- **Q.** What is smart city challenge? **(SUMMER 2022, 3 Marks; SUMMER 2024, 3 Marks)**

3. Infrastructure Systems, Technologies and History:

- **Q.** Explain in detail about what are the different types of infrastructure systems? / List out various infrastructure for smart city. **(SUMMER 2024, 7 Marks; WINTER 2024, 3 Marks)**
- **Q.** Discuss key technologies needed for Smart Cities. **(SUMMER 2022, 7 Marks; WINTER 2022, 3 Marks)**
- **Q.** Give a brief history of smart city project in India. **(WINTER 2022, 7 Marks; SUMMER 2025, 4 Marks)**

Other Important Questions:

1. Smart City Basics and Infrastructure Management:

- **Q.** Explain Infrastructure Need Assessment. **(SUMMER 2024, 4 Marks)**
- **Q.** What are the factors required to become a smart city? **(SUMMER 2024, 7 Marks)**
- **Q.** Explain the key challenges in managing infrastructure in India. Suggest suitable solutions. **(SUMMER 2025, 7 Marks)**
- **Q.** Write the difference between a city and smart city. **(WINTER 2024, 3 Marks)**

Chapter 2: Planning and development of Smart city Infrastructure

Repeated Questions:

1. Green Buildings and Solar Smart Cities:

- **Q.** What is a Green Building? Explain the concept and importance of green building in sustainable development. / Write about the economic benefits of green building. / List out the objectives of green building? **(SUMMER 2022, 3 Marks; SUMMER 2022, 4 Marks; WINTER 2022, 3 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 3 Marks; SUMMER 2024, 4 Marks; WINTER 2024, 3 Marks; SUMMER 2025, 3 Marks; WINTER 2025, 4 Marks; SUMMER 2026, 7 Marks OR)**
- **Q.** What are aims and objectives of solar smart city. **(WINTER 2022, 7 Marks; SUMMER 2023, 4 Marks; WINTER 2025, 3 Marks; SUMMER 2026, 3 Marks)**
- **Q.** Give challenges to solar power plants in India and solutions to overcome it. **(WINTER 2023, 4 Marks; WINTER 2024, 7 Marks OR; SUMMER 2026, 7 Marks OR)**
- **Q.** Explain smart Grid. / Define a smart grid? Discuss its need, features, and applications in India. **(WINTER 2022, 3 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 3 Marks; WINTER 2024, 4 Marks; WINTER 2025, 4 Marks OR; SUMMER 2026, 7 Marks)**

2. Safety, Security and Cyber Security:

- **Q.** Give essentials for safety and security of smart city. / Discuss current security and privacy protection technologies for Smart City. **(WINTER 2022, 7 Marks; SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks; SUMMER 2025, 7 Marks OR; WINTER 2025, 4 Marks)**
- **Q.** What is cyber security? What is need for cyber security in a smart city? / Major threats related to cyber security / Give various cyber safety tips / Explain different types of cyber threats. **(SUMMER 2022, 3 Marks; WINTER 2023, 3 Marks; WINTER 2024, 4 Marks; SUMMER 2025, 4 Marks; WINTER 2025, 4 Marks; SUMMER 2026, 3 Marks OR)**

3. Disaster Management and Early Warning:

- **Q.** Write a detailed note on disaster management in smart city. / Explain phases of disaster management cycle. [Diagram required – refer to the original question paper] **(SUMMER 2022, 3 Marks; SUMMER 2023, 7 Marks OR; WINTER 2023, 7 Marks OR; SUMMER 2024, 3 Marks; WINTER 2025, 4 Marks OR; SUMMER 2026, 3 Marks OR)**
- **Q.** Write a short note on Early Warning System (EWS). **(SUMMER 2023, 4 Marks; WINTER 2023, 3 Marks; SUMMER 2024, 4 Marks; WINTER 2024, 7 Marks)**

4. Housing and Urbanization:

- **Q.** Describe desired criteria for Housing in smart cities. **(WINTER 2022, 4 Marks; SUMMER 2023, 7 Marks; WINTER 2023, 7 Marks; WINTER 2025, 4 Marks; SUMMER 2026, 4 Marks OR)**
- **Q.** Explain how urbanization is connected to environment. **(SUMMER 2022, 4 Marks; WINTER 2025, 4 Marks OR)**

Other Important Questions:

1. Energy and Ecology:

- **Q.** Explain the concept of "Net Zero Energy Buildings." **(SUMMER 2026, 4 Marks)**
- **Q.** Explain energy and ecology in the context of Smart City. **(WINTER 2022, 4 Marks)**

Chapter 3: Intelligent transport systems

Repeated Questions:

1. ITS, GPS and GIS:

- **Q.** Describe role of GPS in transport system management. / Describe the function of GPS and GIS in managing urban traffic. / Enlist various application of GIS in Transportation Engineering. **(SUMMER 2022, 4 Marks; WINTER 2022, 4 Marks; WINTER 2022, 7 Marks; SUMMER 2024, 4 Marks; SUMMER 2024, 7 Marks; WINTER 2024, 4 Marks; SUMMER 2025, 3 Marks; SUMMER 2025, 4 Marks; WINTER 2025, 7 Marks; SUMMER 2026, 3 Marks)**
- **Q.** What is Intelligent Transport system? What are its purpose and application. / Define Intelligent Transportation System (ITS)? Write the advantages of ITS / What are the key features of Intelligent Transport Systems (ITS)? **(SUMMER 2022, 3 Marks; WINTER 2022, 7 Marks; SUMMER 2023, 3 Marks; WINTER 2023, 4 Marks; WINTER 2024, 7 Marks; SUMMER 2025, 4 Marks OR; WINTER 2025, 4 Marks OR; SUMMER 2026, 7 Marks)**

2. Smart Cars, Clean Fuels and Vehicles:

- **Q.** Enlist the features of smart car. / Explain any three features of smart cars. **(SUMMER 2022, 4 Marks; WINTER 2022, 3 Marks; WINTER 2023, 3 Marks; WINTER 2025, 3 Marks; SUMMER 2026, 4 Marks)**
- **Q.** Write a short note on: Fuels of future. / Explain the importance of clean fuels and electric vehicles in sustainable urban transport systems. **(WINTER 2022, 3 Marks; WINTER 2024, 4 Marks; SUMMER 2025, 7 Marks OR; WINTER 2025, 3 Marks OR)**
- **Q.** What do you understand about Solar vehicles? / Write short note on Fuel Cell Electric Vehicle. / Define smart vehicles. **(SUMMER 2023, 3 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 3 Marks; WINTER 2024, 3 Marks; SUMMER 2025, 3 Marks OR)**

3. E-ticketing, Smart Mobility and Traffic Safety:

- **Q.** Explain the concept of E-ticketing. **(SUMMER 2022, 7 Marks; SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; WINTER 2025, 4 Marks OR; SUMMER 2026, 4 Marks)**
- **Q.** What is smart mobility and how it can be improved? **(SUMMER 2022, 4 Marks; SUMMER 2023, 4 Marks)**
- **Q.** Write a short note on Traffic safety management. / Give recommendations for infrastructure improvement and vehicle technology for traffic safety. **(SUMMER 2022, 7 Marks; SUMMER 2023, 3 Marks; SUMMER 2024, 4 Marks)**
- **Q.** Give your views on road safety policies. / Explain National road safety policy 2010 in brief. **(SUMMER 2022, 7 Marks; WINTER 2022, 4 Marks; SUMMER 2024, 7 Marks; WINTER 2024, 7 Marks)**

Other Important Questions:

1. Satellite Navigation and ITS Drivers:

- **Q.** What do you understand by Satellite Navigation system? Explain NavIC in detail. **(WINTER 2023, 7 Marks)**
- **Q.** What are the key drivers and tools of ITS. **(WINTER 2023, 3 Marks)**

Chapter 4: Management of water resources and related infrastructure

Repeated Questions:

1. Smart Water and Sanitation:

- **Q.** Describe various smart water management technologies. / Write about the IOT based smart wastewater management system. / Enlist the goals and tools of Smart Water Management. **(SUMMER 2022, 7 Marks; WINTER 2022, 3 Marks; WINTER 2022, 4 Marks; SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; WINTER 2025, 4 Marks)**
- **Q.** Write a note on water-meters. **(WINTER 2024, 3 Marks; WINTER 2025, 3 Marks OR)**
- **Q.** Describe sustainable water and sanitation. What are issues and challenges of urban sanitation? / What are the benefits associated to water and wastewater management? / Discuss sustainable sanitation practices in Smart Cities **(SUMMER 2022, 4 Marks; WINTER 2022, 7 Marks; SUMMER 2024, 7 Marks; WINTER 2024, 7 Marks; SUMMER 2025, 4 Marks; SUMMER 2026, 7 Marks)**
- **Q.** Write short note on Innovative Sanitation Solutions for smart cities. **(WINTER 2022, 7 Marks; WINTER 2023, 4 Marks; SUMMER 2024, 7 Marks; WINTER 2024, 4 Marks; SUMMER 2026, 4 Marks OR)**
- **Q.** Give some suggestions to improve existing water conveyance system. / Explain the free flow and pressurized water conveyance system. **(SUMMER 2022, 3 Marks; SUMMER 2024, 3 Marks; WINTER 2024, 7 Marks)**

2. Floods and Flood Management:

- **Q.** Describe various flood mitigation measures. **(SUMMER 2022, 7 Marks; SUMMER 2023, 4 Marks; WINTER 2025, 4 Marks)**
- **Q.** What are causes of floods and what are its effects. **(SUMMER 2023, 3 Marks; WINTER 2023, 7 Marks; WINTER 2025, 4 Marks)**
- **Q.** Write short note on Integrated Flood Management System. **(WINTER 2024, 7 Marks; SUMMER 2026, 3 Marks)**
- **Q.** Explain flood forecasting and warning systems in India. **(SUMMER 2022, 4 Marks; SUMMER 2026, 7 Marks OR)**

3. Water Resource Conservation and Rainwater Harvesting:

- **Q.** Describe various methods for water resource conservation. / Enlist various methods of water resource conservation, and explain in details (i) River Linking (ii) Increasing forest cover. **(SUMMER 2022, 7 Marks; SUMMER 2023, 7 Marks; WINTER 2023, 7 Marks; SUMMER 2025, 7 Marks OR; WINTER 2025, 7 Marks OR)**
- **Q.** Define rainwater harvesting? Describe its methods and importance. / Objectives of Rain Water Harvesting. **(WINTER 2023, 3 Marks; WINTER 2024, 4 Marks; SUMMER 2026, 7 Marks)**

Other Important Questions:

1. Flood Management, Water Storage and Sewerage:

- **Q.** What is flood management in urban planning? **(SUMMER 2025, 3 Marks)**
- **Q.** Discuss the planning and development of water storage and conveyance systems in Smart Cities. **(SUMMER 2025, 7 Marks)**
- **Q.** How does a sewerage system contribute to public health? **(SUMMER 2025, 4 Marks OR)**

Chapter 5: Infrastructure Management system & Policy for Smart city

Repeated Questions:

1. Infrastructure Management Systems and PAN City Projects:

- **Q.** Describe Integrated Infrastructure Management Systems for smart city. / What are the benefits of Integrated Infrastructure Management system (IIMS)? **(WINTER 2022, 7 Marks; WINTER 2023, 3 Marks; SUMMER 2025, 3 Marks; WINTER 2025, 7 Marks)**
- **Q.** Write in brief about PAN city project. / Discuss various PAN city projects undertaken by Smart City Ahmedabad. **(WINTER 2022, 4 Marks; WINTER 2024, 3 Marks; WINTER 2025, 3 Marks)**

2. Smart Cities Mission, Guidelines and Policies:

- **Q.** Explain strategies for smart city mission in India. / Write a short note on Smart Cities Mission of India. / Describe the Smart Cities Mission policy and its guidelines issued by the Government of India. **(SUMMER 2025, 4 Marks; SUMMER 2025, 7 Marks OR; WINTER 2025, 7 Marks)**
- **Q.** Enlist guidelines for Smart City in INDIA. / List any two features of India's Smart City Guidelines. **(WINTER 2022, 3 Marks; SUMMER 2025, 3 Marks OR)**
- **Q.** State any two worldwide policies for smart cities. / Briefly describe one international policy or approach to Smart Cities. **(SUMMER 2025, 4 Marks OR; SUMMER 2026, 4 Marks)**
- **Q.** List down procedure for selection of smart city in India. / Explain various steps for selection of smart city. **(SUMMER 2023, 4 Marks; WINTER 2023, 7 Marks)**

3. Case Studies and Projects in India:

- **Q.** Give detailed case studies of any two smart cities of India. / Write a detailed case study of any one Smart City in India. **(SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; SUMMER 2025, 7 Marks; SUMMER 2026, 7 Marks)**
- **Q.** Give SWOT analysis of any one smart city of India. **(WINTER 2023, 7 Marks; WINTER 2024, 7 Marks)**
- **Q.** Write short note on GIFT City. **(WINTER 2024, 4 Marks; SUMMER 2026, 3 Marks)**
- **Q.** Write a short note on Delhi - Mumbai Industrial corridor. **(SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks)**
- **Q.** Write short note on LAVASA. **(WINTER 2022, 4 Marks; WINTER 2023, 4 Marks)**

Other Important Questions:

1. Integrated Approach and Government Targets:

- **Q.** What is the need of integrated approach of infrastructure management? **(SUMMER 2023, 3 Marks)**
- **Q.** Give targets laid down by GOI for development of smart cities. **(SUMMER 2023, 3 Marks)**

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