PART 1

Read the text below and answer questions 1–13.

THE CRUMBLING FOUNDATIONS: AGING INFRASTRUCTURE IN THE MODERN WORLD

Much of the infrastructure that enables modern life—bridges, tunnels, water networks, rail corridors, power grids, and public buildings—was built decades ago under assumptions about population growth, climate stability, and maintenance budgets that no longer hold. In many countries, systems designed for mid-twentieth-century loads are now being operated beyond their intended lifespan, while demand has increased and environmental conditions have become more volatile. The result is not merely an engineering headache but a compound risk that blends technical deterioration with economic incentives and political decision-making.

Infrastructure rarely fails only through dramatic collapses. More commonly, it degrades quietly and unevenly. Reinforced concrete can suffer from carbonation, which lowers alkalinity and allows steel reinforcement to corrode, or from chloride ingress, where salts penetrate the concrete and accelerate rusting. Corrosion expands steel, cracks surrounding concrete, and reduces load-bearing capacity long before any visible damage appears on the surface. Steel structures face metal fatigue: repeated cycles of stress can initiate micro-cracks that grow slowly until they become dangerous. Buried water pipes may leak for years, undermining soils and roadbeds, while electrical systems can become vulnerable through insulation breakdown or component aging. Because these processes develop out of sight, problems are often discovered only when deterioration is advanced and repairs become more disruptive and expensive.

Preventive maintenance is therefore decisive, but it is also easy to postpone. Routine inspections, sealing, resurfacing, and targeted replacement can slow deterioration and keep small defects from compounding. Yet maintenance competes with other public spending, and its benefits are largely invisible: a bridge that does not collapse rarely generates headlines, while a new project offers ribbon-cutting opportunities. This political economy encourages deferred maintenance, producing backlogs that expand faster than annual repairs. Once a system falls behind, each year of delay can raise costs, because repair shifts from minor intervention to major rehabilitation, replacement, or emergency response.

Climate change adds further stress to already strained assets. Heavier rainfall can overwhelm stormwater networks and accelerate scour around bridge foundations, while more frequent freeze-thaw cycles in some regions can worsen cracking. Heatwaves can buckle rail tracks, soften asphalt, and raise peak electricity demand, straining power

systems precisely when equipment is more likely to fail. Sea-level rise and storm surges can increase salinity in coastal zones, accelerating corrosion in exposed steel and in concrete structures where chlorides are present. Infrastructure designed around historical averages may now face conditions that were once rare, turning what were intended as safety margins into routine operating conditions.

Engineering solutions exist, but scaling them is difficult. Sensors and structural-health monitoring systems can detect strain, vibration changes, moisture intrusion, and crack growth, allowing agencies to prioritise repairs before failure. IoT networks can provide continuous data on water pressure, leakage, and pump performance, while analytics can help compare risk across thousands of assets. On the materials side, improved mixes, protective coatings, and cathodic protection can slow corrosion by controlling electrochemical reactions, extending the life of critical elements. However, retrofitting is disruptive, requires skilled labour, and often demands shutting down the very services people rely on. In addition, modern infrastructure increasingly depends on software and networked control systems, which introduces cybersecurity vulnerabilities alongside physical wear.

The human consequences of deterioration are not evenly distributed. Affluent areas may secure upgrades quickly through stronger tax bases, political influence, or higher credit capacity, while poorer communities endure boil-water advisories, unreliable transit, or unsafe roads for longer. When service interruptions become normalised, trust in public institutions can erode, making it harder to build support for the large, long-term investments that renewal requires. This can create a self-reinforcing cycle: weak services reduce trust, low trust reduces willingness to fund improvements, and deterioration accelerates.

Financing models shape what is possible. Fuel taxes, tolls, and municipal bonds can provide substantial resources, but they depend on political acceptance and stable revenue. Short-term grants can favour projects with quick visible outputs rather than the less visible work of maintenance and renewal. Public-private partnerships (PPPs) can mobilise capital and expertise, yet they also involve long contracts that may shift risk in ways the public finds difficult to evaluate. If incentives are poorly designed, PPPs can prioritise measurable outputs over long-term service quality, or restrict flexibility to adapt to future climate conditions.

Long-term resilience requires a different mindset: treating maintenance as a continuous public service rather than an occasional crisis response. This implies transparent asset inventories, stable funding for inspection and renewal, and decision-making that considers lifecycle costs rather than only upfront construction budgets. It also means updating

design standards for future climate extremes rather than rebuilding the past. Ultimately, aging infrastructure is less a single problem than a system of incentives. When maintenance is neglected, deterioration accelerates; when investment is delayed, costs compound. The practical choice is not between spending and saving, but between planned renewal and emergency repair.

Questions 1–5

Complete the summary below. Choose **ONE WORD ONLY** from the text for each answer.

Why infrastructure deteriorates

Many networks are now operating beyond their intended **1** ..... . Political incentives encourage deferred maintenance, producing **2** ..... that expand faster than annual repairs. Preventive **3** ..... is decisive but easy to postpone. Climate stressors described include heavier rainfall, **4** ....., and rising seas. Repeated service interruptions may erode public **5** ..... .

Questions 6–9

Select the correct answer.

6 According to the passage, what is the most common pathway to infrastructure failure?

A Sudden breakdowns that occur without warning signs
B Gradual deterioration that remains hidden until late stages
C Damage mainly caused by cyberattacks rather than physical wear
D Early detection that consistently keeps repairs cheap

7 Why do governments often postpone routine maintenance, according to the passage?

A It creates immediate, highly visible improvements
B It is automatically funded and needs no trade-offs
C Its costs are immediate while its benefits are largely invisible
D It is unnecessary once monitoring sensors are installed

8 What added risk comes from infrastructure's growing dependence on digital systems?

A Exposure to cybersecurity vulnerabilities
B Elimination of physical deterioration through software updates
C Reduced need for inspection because faults self-correct
D Guaranteed protection from climate-related impacts

9 What principle is presented as essential for long-term resilience?

A Treating maintenance mainly as a response after breakdowns
B Funding only projects with rapid visible outputs
C Avoiding transparent asset inventories to prevent controversy
D Using decision-making that considers lifecycle costs

Questions 10–13

Choose **TRUE** if the statement agrees with the information given in the text, choose **FALSE** if the statement contradicts the information, or choose **NOT GIVEN** if there is no information on this.

10 The passage states that infrastructure problems are usually detected early because they are highly visible.

11 The passage indicates that political incentives can favour new construction over maintenance spending.

12 The passage suggests that repeated service disruptions may reduce confidence in public institutions.

13 The passage argues that municipal bonds are the most effective method of funding infrastructure upgrades.

Answer Key

1. lifespan
2. backlogs
3. maintenance
4. heatwaves
5. trust
6. B
7. C
8. A
9. D
10. FALSE
11. TRUE
12. TRUE

13. NOT GIVEN