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ক) List two potential benefits of food printing technology

খ) Diagnose the main barriers to widespread adoption

গ) Design a marketing campaign to improve consumer acceptance

ঘ) Propose a cost-sharing model for developing countries

2. Melting Arctic ice unlocks 30% of Earth's undiscovered gas and 13% of oil, triggering territorial claims by Russia, Canada, and Denmark. Indigenous communities report 300% more industrial encroachment since 2015. The UNCLOS treaty governs disputes but lacks enforcement mechanisms for environmental violations.

ক) Estimate the economic motivation behind Arctic competition

খ) Map the stakeholders in Arctic resource conflicts

গ) Predict consequences of unchecked industrial expansion

ঘ) Draft amendments to strengthen UNCLOS for ecological protection

3. The '15-minute city' urban model aims to provide all essential services within walking/biking distance. Paris has converted 50km of roads to pedestrian zones, while Melbourne's '20-minute neighborhoods' show 23% lower carbon emissions. Critics argue such plans may inadvertently create segregated communities.

ক) Define the core principle of a 15-minute city

খ) Analyze the environmental evidence from Melbourne

গ) Debate the potential social risks mentioned

ঘ) Adapt this model for a car-dependent American suburb

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ক) Convert the debris speed from mph to km/s (1 mile = 1.6 km)

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গ) Explain why small debris particles pose disproportionate risks

ঘ) Propose international regulations to prevent future debris accumulation

6. Lab-grown diamonds now constitute 8% of the global diamond market, requiring 90% less water than mined gems. De Beers' synthetic division grows stones at $300/carat compared to $4,000 for natural ones. However, the energy-intensive process still relies on 60% fossil fuels in most facilities.

ক) Calculate the price difference percentage between synthetic and natural diamonds

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7. Deepfake cases increased 900% from 2019-2023, with 95% being non-consensual pornography. Detection tools achieve only 79% accuracy, while AI-generated voices can mimic humans with just 3 seconds of audio. South Korea mandates watermarking synthetic media, but enforcement remains inconsistent globally.

ক) Identify the most alarming statistic about deepfake misuse

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ঘ) Design a school curriculum module on digital media literacy

8. By 2030, AI and automation may displace 400 million workers globally while creating 97 million new tech-focused roles. This shift requires massive reskilling—the World Economic Forum estimates 50% of employees will need training by 2025. Countries like Singapore invest $3 billion annually in lifelong learning programs, whereas developing nations risk being left behind.

ক) Calculate the net job loss/gain predicted by 2030 based on the data

খ) Analyze how the 'reskilling gap' could widen global inequality

গ) Design a 3-tier workforce adaptation program for a mid-sized city

ঘ) Propose metrics to evaluate the success of reskilling initiatives

9. Vertical farming yields 100x more produce per square foot than traditional agriculture but consumes 40% more energy. Singapore's 120 vertical farms now supply 14% of its leafy greens, while Dubai's $40 million 'Food Tech Valley' aims for 300% higher productivity using AI-controlled environments.

ক) Identify the key productivity statistic mentioned

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10. The global e-waste crisis sees 57 million tons discarded annually—equivalent to 5,500 Eiffel Towers. Only 17% is properly recycled, while 83% leaks toxins like mercury into ecosystems. Ghana's Agbogbloshie dump receives 40% of Europe's illegal e-waste exports, causing severe health impacts.

ক) Visualize the e-waste volume comparison

খ) Trace the illegal e-waste supply chain described

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11. Google's 72-qubit processor solves in 200 seconds what supercomputers need 10,000 years for. China invests $15 billion in quantum research annually, while the US prioritizes military applications. Ethical concerns include breaking current encryption—potentially exposing 98% of global financial data.

ক) Paraphrase the quantum advantage described

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