Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

mitigation reduces the cause, i.e. greenhouse gas emissions, e.g. wind and solar power / planting forests; adaptation reduces the damage of the change, e.g. sea walls / drought-resistant crops / early warnings

2.2

capacity = the money, knowledge and government to respond; the Netherlands is low-lying but rich, so it can build and maintain strong sea defences, so it is less vulnerable; Tuvalu (or Bangladesh) has low land and little money, so it cannot easily protect itself and is more vulnerable

2.3

any two: thousands of cyclone shelters; early warnings by radio and phone, and evacuation; trained volunteers; better forecasting

2.4

any three: more heat stress and deaths in heatwaves; diseases such as dengue spread to new areas as mosquitoes spread; lower crop yields in hot or dry regions; floods damage crops and spread water-borne disease; warmer, more acidic oceans harm fish and coral, so less food from the sea

2.5

global: almost every country joined; aim: well below 2 °C, try for 1.5 °C, with pledges reviewed every five years; limit: pledges are voluntary, with no penalty if they are missed; judgement: even if all pledges are met, warming is still expected to pass 2 °C, so it is a step forward but not enough on its own

3.1

(a) any two: more people live on the floodplain (60 % against 15 %); no early-warning system; less money to spend per person on drainage; many homes in informal settlements / weaker houses

(b) any two, explained: an early-warning system by phone and radio, so people move to safety before the flood; sponge-city parks, wetlands and porous pavements hold rain where it falls and lower the peak; zoning to stop new building on the floodplain lowers exposure over time; raised houses or embankments keep water out of homes

3.2

Mark with the markbands: [9-10] focused on the command term, detailed and accurate knowledge, well-developed explanation, specific named examples (places, dates, numbers), balanced evaluation and a supported conclusion; [7-8] mostly focused, good knowledge and examples, some evaluation; [5-6] relevant knowledge and examples, explanation

partly developed, little evaluation; [3-4] general knowledge, few examples, mostly description; [1-2] little that is relevant. Points that may be included: adaptation saves lives now: Bangladesh shelters and warnings cut cyclone deaths from about 300,000 (1970) to a few dozen (2020); some warming is already locked in (about 1.1 °C), so places must adapt anyway; adaptation is local and visible, e.g. sponge cities such as Wuhan, so governments can act alone; but adaptation has limits: Tuvalu cannot raise its land fast enough, and the Zhengzhou rain of 2021 was far beyond the design; poor places have little capacity to adapt, so adaptation alone increases inequality; mitigation reduces the cause for everyone: the Paris Agreement aims for well below 2 °C; China's pledge to peak CO_2 before 2030 matters because it emits about a third of the world's CO_2; without mitigation, the cost of adaptation keeps rising; conclusion: both are needed; adaptation is urgent locally, but only global mitigation stops the problem growing