Solutions

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

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

2.1

population density: people per km^2 of the **total** land area; physiological density: people per km^2 of **farmland** only, so it shows the pressure on land that grows food

2.2

natural increase $= 30 - 10 = 20$ per 1,000 $=$ **2.0** % a year; doubling time $\approx 70 \div 2.0 =$ **35** years

2.3

$9.54 - 10.93 = -$**1.39** million (a natural decrease); stage 5: very low birth rate, deaths above births, population falling

2.4

$\frac{24 + 6}{50} \times 100 =$ **60**; youthful: most dependants are children (24 million against 6 million)

2.5

A has a wide base that narrows quickly: many children, high birth rate and short life expectancy; so A is in stage 2 (or early stage 3); B has a narrow base and a wide middle and top: few recent births, many older people; so B is in stage 4 or 5

3.1

(a) stage 2; the death rate has fallen but the birth rate is still high, so the gap (natural increase) is largest

(b) any two, explained: clean water, vaccines and better medicine lower deaths quickly, but families still want many children as workers or as care in old age; more food and better farming lower deaths, while traditions and religion change slowly, so birth rates stay high; child deaths fall first, and families have fewer children only once they trust that their children will survive

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: useful: it explains the link between development and birth and death rates; it matches the history of many countries, e.g. the United Kingdom over about 200 years; it helps predict needs: a stage 2 country needs schools and jobs, a stage 5 country pensions and care; limits: based on European history; China moved through stages 2 to 4 in about 50 years, partly through government policy (one-child policy, 1980–2015); it leaves out migration, which changes population in, e.g., the Gulf states or Germany; it gives no time scale, and some countries may stay

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in stage 2 or 3 because of poverty or conflict; HIV/AIDS raised death rates in parts of southern Africa in the 1990s, which the model does not show; stage 5 (very low birth rate, as in Japan and China) was added later, so the model is not a fixed law; conclusion: useful as a general description and for comparing countries, but weak at predicting the timing or causes in a particular country