Now Test Yourself: Answers

Topic 1

Page 7
How many atmospheric cells are in each hemisphere?
Three: the Hadley, Ferrel and Polar cells.

Page 8
1. How do temperature and rainfall change as you move away from the equator towards the North and South Poles?
Temperature declines towards the poles. Rainfall also reduces, but in a more complex pattern because of high- and low-pressure areas.

2. What is thought to have caused the Little Ice Age?
A period with fewer sunspots than normal, and less solar radiation received by the Earth.

Page 10
Name three sources of evidence used to reconstruct climate in the past.
Ice cores, tree rings and historical sources (paintings, diaries, harvest records).

Page 11
What human activity produces the most greenhouse gas emissions?
Energy supply.

Page 13
What is the main cause of the rise in global sea levels?
Thermal expansion due to ocean warming.

Page 14
State the high and low range of possible global temperature increases by 2100.
The range is between +1 °C and +5 °C.

Page 15
In which months are tropical cyclones likely in the northern hemisphere?
May to December.

Page 16
What ocean temperature is needed for a tropical cyclone to form?
26.5 °C.

Page 17
What tropical cyclone hazard causes coastal areas near the sea to flood?
Storm surges.

Page 18
Why are cities like New Orleans and Dhaka very vulnerable to coastal flooding?
They are located on low-lying coastlines.

Page 19
What is FEMA responsible for in the USA?
Managing the response to natural disasters, including hurricanes.
Page 20
Which of Earth’s layers is liquid?
The outer core.

Page 23
Which type of plate margin does subduction happen at?
Convergent (or destructive).

Page 25
Which type of volcano is more dangerous to people: composite or shield?
Composite.

Page 26
How many people were made homeless by the 2010 Haiti earthquake?
1 million people.

Page 27
Which tectonic hazard can be predicted: earthquakes or volcanic eruptions?
Volcanic eruptions.

Page 29
Which three measures are combined in the human development index?
Income, life expectancy and education.

Page 31
Which type of country has the largest proportion of people aged 0–15 in its population pyramid?
Developing countries.

Page 32
Explain how disease could affect people’s ability to earn a living.
Disease reduces the ability to work and earn money, and so lowers incomes.

Page 33
Which stage in Rostow’s model are emerging countries at?
Stage 3 or 4.

Page 34
Why have many Asian countries proved attractive places for TNCs to locate some of their business to?
Low wages, low taxes and lack of regulations.

Page 35
What is meant by intermediate technology?
Simple, low-cost, easy-to-build and fix technology.

Page 36
Which people often benefit most from top-down development?
People in urban areas, who may already have decent incomes.

Page 38
1. What was China’s population in 2016?
1.38 billion.
2. How many Chinese people live in other countries?
50 million.

How did China’s economic sectors change between 1990 and 2015?
Primary shrank, while secondary and tertiary grew.

Which countries and regions are the main sources of FDI flowing into China?
Europe, North America, Japan and Hong Kong.

Why has China’s population changed in a unique way, compared to other emerging countries?
Because of the One Child Policy.

Explain why Sichuan’s population fell between 2000 and 2010.
Because of rural–urban migrants leaving Sichuan.

Which type of people have the lowest incomes in China?
Farmers in rural areas.

In which year did China become the world’s largest emitter of carbon dioxide?
2004.

Which other Asian country is closest to China in terms of military strength?
India (because it also has nuclear weapons).

Will the average Chinese person be as wealthy as the average American by 2030?
No, the average American will still be much wealthier.

Which is the least urbanised continent?
Africa.

Name a primate city.
London, Mexico City or Lagos.

Which types of cities have most employment in the informal sector?
Developing world cities.

What is the movement of people out of urban areas into rural areas called?
Counter-urbanisation.
What type of land use is found in the CBD of cities?
Retail.

How many people live in Karachi?
24.3 million in 2016.

Where is most industry in Karachi located?
Close to the port and rivers, and along some major roads.

How many rural migrants arrive in Karachi each month?
40,000–50,000.

How many people are estimated to live in the Orangi Town slum?
2.5 million.

What type of area is Clifton in Karachi?
A wealthy area.

State two benefits of the Karachi Metrobus project.
Reduced pollution, reduced congestion and faster journey times.

What percentage of Orangi’s streets now have sewers?
90 per cent.

1. Name one location in upland Britain renowned for its glaciated landscape.
Lake District; also Snowdonia, Scottish Highlands.

2. Name one landscape feature in lowland Britain that was produced by folding.
The Weald; also the Cotswolds, the London Basin.

What were the three main processes that affected Britain during the Ice Age?
Glacial, fluvioglacial and periglacial.

1. What are the distinctive characteristics of granite?
A hard and coarse-grained rock made largely of quartz and feldspar. It is formed by the slow cooling of magma.

2. Why is chalk so resistant to erosion?
Chalk is a hard and highly porous rock, so that water percolates through it rather than eroding it.
Page 67
Identify three landscape differences between the Yorkshire Dales and the Fens.
Altitude (well above sea level vs close to sea level); geology (limestone vs silt and peat); relief (hilly vs flat); stone field boundaries vs embankments and dykes.

Page 68
What is the difference between rock type and rock structure?
Rock type refers to physical characteristics (hard, soft; sedimentary, igneous; porous, impervious). Rock structure relates to the physical arrangement of different rock strata (folded, faulted).

Page 70
1. How does the sea transport sediment?
By longshore drift and other currents rolling sediments along the sea floor or carrying them in suspension.

2. What causes the sea to deposit sediment?
When its load exceeds its carrying capacity, as when there is a reduction in speed.

3. Suggest what caused the formation of Poole Harbour.
Poole Harbour was formed by a rise in sea level and the drowning of a river estuary.

Page 71
1. Which activities compete for seafront locations?
Power station, because of its extent and height. Others include: ports, tourism and industry.

2. Identify two conflicting coastal land uses.
Tourism and industry.

3. Why might there be objections to the building of an offshore wind farm?
It would spoil the sea views for tourists; it would be a hazard to shipping.

Page 72
Why was the original shoreline of Southampton Water mainly mudflats and salt marsh?
Because of the large amount of silt deposited in Southampton Water by the rivers Test, Itchen and Hamble. Southampton Water is long, narrow and sheltered from the open sea so little silt is removed by the sea.

Page 74
What are the distinguishing features of a soft engineering approach to coastal management?
The approach really involves working with nature rather than against it. Replenishing beaches and regrading cliffs are preferred to building sea walls.

Page 75
What are the benefits of integrated coastal zone management?
The main benefit is the holistic or systems approach. Each cell is a discrete unit. This allows the impacts of any management intervention to be more readily identified.

Page 76
Why does sediment size decrease downstream?
Because the velocity of the river decreases and sediment size is reduced by attrition.

Page 78
1. What are the four important components of a hydrograph?
Rising limb; peak discharge; time lag; falling limb.
2. How does drainage basin shape affect time lag?
The more elongated the drainage basin, the shorter the time lag. This is because distances between the watershed and river will be short, therefore reducing runoff times.

3. Why is the rising limb often steeper than the falling limb?
Because shortly after the storm, much of the rainfall will reach the river by the fast route of surface runoff. This will result in a steep rising limb. Gradually, more of the rainwater will sink into the ground and therefore reach the river more slowly. The discharge will, of course, decline once most of the rainfall has reached the river.

Page 79
What do these two land-use changes have in common in terms of changing hydrographs?
Both will speed up the time lag and rate of runoff. Urbanisation will do so by its drains and smooth, hard surfaces; deforestation does this by its bare soil surface and having no trees to intercept the rainfall.

Page 80
1. What is most noticeable about the distribution of flooding shown in Figure 4.15?
The worst flooding is not near the coast, but where the rivers first drain into the Somerset Levels.

2. Do floods always have to have human causes?
No. They can simply be caused by abnormally heavy or prolonged rainfall, or by unusually high temperatures causing a sudden melting of ice and snow.

Page 81
Give two reasons why people will be at greater risk of flooding in the future.
Because global warming will probably cause a rising sea level; this will increase the flood risk in coastal areas. It is also likely to bring more stormy weather with more torrential rainfall and there is a raised risk of flooding.

Page 82
Suggest some ways people might improve the flood-proofing of their homes.
Install lightweight flood barriers, flood pumps, vent covers for airbricks. Replace solid ground floors with suspended ones. In an emergency, move furniture, rugs, electronics and other belongings to upper floors, or at least raise them off the ground floor.

Topic 5
Page 84
1. What is the difference between a conurbation and an urban core?
An urban conurbation is a large urban area formed by the growing together of once-separate settlements (for example, the West Midlands conurbation involving the cities of Birmingham and Wolverhampton joined together with other once-separate urban settlements). An urban core comprises a major city and its immediate sphere of influence (for example, London and the south-east of England).

2. What are the main indicators of ethnicity?
Groups of people distinguished by their distinctive racial characteristics, culture and customs.

Page 85
1. What has persuaded people to migrate southwards in the UK?
Better job prospects; higher wages/salaries; higher standard of living; better services; wish to be living in or close to the centre of things (that is, in London).
2. Why are people today living longer than they were 50 years ago?
Better diet; better medical services; more hygienic housing and physical infrastructure; better knowledge of what constitutes a healthy lifestyle.

Page 86

What is meant by teleworking?
Working from home using modern technology to keep in touch with employers. Jobs can be relocated to places where it is more attractive, more convenient or cheaper to live.

Page 87

1. Look at Figure 5.3. What is significant about human resources?
The quality of human resources is important to the growth of the global economy. Important aspects of those resources include education, skills, endeavour, a strong work ethic, enterprise, imagination and innovation.

2. Can you name three TNCs, other than the examples given above, that have factories or offices in the UK?
Examples include Apple; ExxonMobil; General Motors; Mitsubishi; Nestlé; Vodafone.

Page 88

What is the difference between situation and connectivity?
Situation is the physical location of a town or city in a region or country. Connectivity relates to the links a town or city has with the region or country in which it is situated. Those links can be physical (for example, roads and railways), economic (for example, providing jobs) and social (for example, providing hospitals and colleges).

Page 89

1. Look at Figure 5.4. What land uses are found close to the peak land value intersection?
Businesses (shops, banks, personal services); government and public buildings; bus, coach and railway stations.

2. What are the attractions of a location on the edge of a city?
Cheaper land; more accessible; more pleasant environment; less pollution.

Page 92

Compare Figures 5.7 and 5.8. Is deprivation highest in those parts of London where ethnic minorities are most concentrated?
The highest levels of deprivation occur in the inner-city zone. They are particularly concentrated in one area on the north side of the Thames. The distribution of ethnic minorities shows not one, but five separate concentrations, mainly in the inner-city zone but also reaching out into the outer suburbs.

Page 93

What are the advantages to a young family of living in a dormitory settlement rather than in London?
Parents are more likely to be able to afford better housing, including a garden; more amenities such as parks and playing fields; a safer and healthier living environment; better access to the countryside.

Page 94

Can you think of any negatives associated with regeneration?
Loss of, or change in original character; displacement of people and businesses.

Page 95

Study Figure 5.10. Can you identify the following important elements in the regeneration: the Olympic Stadium, Stratford International Station, Westfield Retail Centre? Why are the last two important?
Olympic Stadium: provides a venue for football and other high-profile sports.
Stratford International Station: an important transport hub that greatly increases the accessibility of east London.
Westfield Retail Centre: attracts people from a wide area to come shopping; they in turn become aware of other aspects of the regeneration.

**Page 96**

**What is meant by sustainability?**

In this context, sustainability refers to improvements in the quality of life that can be afforded, as well as supported, without inflicting damage on the environment. In other words, that future generations will also be able to enjoy those improvements.

**Page 97**

**Can you give some examples of the benefits that London and the rural areas around it gain from the interdependence?**

London benefits from such things as water, building materials and recreational space supplied by rural areas. The rural areas benefit from the employment opportunities, entertainment and high-order retailing available in London.

**Page 99**

1. **What are the main changes affecting the rural area you have studied?**

   Possible change headings are: environment, population, economy and society.

2. **What other activities are there in the primary sector?**

   Fishing, forestry, mining and quarrying.

3. **What are the main indicators of deprivation?**

   Poor housing; short life expectancy; high levels of unemployment and crime; low educational attainment.

**Page 101**

**What sort of jobs are suited to teleworking in remoter rural areas?**

Internet sales, financial services, advertising and web design.

**Topic 7**

**Page 115**

**How much does temperature fall for every 200 m increase in altitude?**

1°C per 200 m.

**Page 116**

**Name the two gases exchanged between plants and the atmosphere.**

Oxygen and carbon dioxide.

**Page 118**

**What do plants take from soil as they grow, and return to the soil when they die and decay?**

Nutrients.

**Page 119**

**According to Boserup, how much food could the world produce?**

Enough to feed any number of people.
**Topic 8**

**Page 120**
1. Why is sunlight so important to plant life?
Plants derive the energy they need for growth from sunlight through the process of photosynthesis.

2. Why do trees have buttress roots?
To give them support to remain upright. This is necessary as soils are thin and root systems shallow.

**Page 121**
1. How many layers are there in tropical rainforest, and what are the differences between them?
Four layers. The amount of sunlight that they receive.

2. What are biomass and litter?
Biomass is the total amount of living organisms within a given area or ecosystem layer. Litter is the total amount of dead organic matter.

**Page 122**
1. How does the vertical structure of the taiga differ from that of the tropical rainforest?
There are only two layers compared with four in the tropical rainforest.

2. Why are tree roots typically shallow?
To avoid getting permanently frozen.

3. Which feature of the taiga climate do you think is most challenging for living organisms and why?
Long, cold winters. Temperatures below freezing mean little or no growth in living organisms.

**Page 123**
1. What are the factors controlling the rate of nutrient cycling?
Temperature and amount of precipitation.

2. Using Figure 8.5, give an example of a) a primary consumer and b) a secondary consumer.
a) Primary consumer (herbivore): hare, squirrel, moose.
b) Secondary consumer: wolf, birds of prey (owls, hawks).

**Page 125**
1. Why do you think there is much more concern about the loss of tropical rainforest than the loss of the taiga forest?
Because there is less tropical rainforest than taiga, and the rate of deforestation is much greater in tropical rainforest.

2. How does deforestation cause soil erosion?
Trees protect the soil from the erosive effects of direct precipitation and runoff.

3. Which activities are likely to cause the most serious river pollution?
Mining; lumbering leading to eroded soil entering rivers.

**Page 126**
How do hydroelectric power developments threaten the taiga?
The creation of HEP reservoirs involves the clearance and drowning of large areas of taiga. The building of reservoirs and generating plants requires the construction of roads. Power lines also require cleared paths through the taiga.
1. Which threats to biodiversity are mainly the outcome of human activity?
Biodiversity threatened by fires, illegal logging; environmental pollution; introduced pests and diseases.

2. How do dying trees impact on the food web?
They reduce the amount of food passing along the food chain.

Which of CITES or REDD do you think is more successful in protecting biomes? Give your reasons.
Possibly REDD, but it only applies to forest biomes; CITES is more focused on individual species rather than biomes.

1. Which of these three sustainable forest management activities offers the most secure livelihood? Give your reasons.
Agroforestry, because it provides food, fuel and a source of income from the sale of timber and food.

2. Suggest two possible disadvantages of ecotourism.
It is small scale; it is only feasible in particular types of environment (for example, unspoilt forest); it is a form of tourism that does not appeal to the masses.

Why is the last of these three needs important?
The build-up of carbon dioxide in the atmosphere will increase global warming and climate change.

1. Explain the link between energy consumption and living standards.
A high living standard is associated with such things as: energy-consuming appliances in the home; heating and cooling the home; car ownership and the consumption of fossil fuels; the consumption of food with high-scoring ‘food miles’.

2. Why is access to cheap, reliable energy important to a country and its people?
It facilitates economic development and helps raise quality of life. To be energy self-sufficient is the best possible situation for a country.

3. What is meant by the term ‘energy resource’?
Any material or flow that can be converted into energy, for example coal or hydropower.

1. What is the problem with carbon emissions?
They act as a blanket and prevent radiation escaping into space. Hence global warming.
2. Which energy resource has the greatest environmental impacts when converted into electricity?
Coal.

Page 134
Which renewable source of energy is affected by geology?
Geothermal.

Page 135
1. Why is population size not considered to be one of the factors?
Because energy use (consumption) is better expressed in per capita terms.

2. Figure 9.4 shows a low level of energy use over much of Africa. What are the reasons for this?
Relatively low levels of development; generally low standards of living; climate.

Page 136
1. Name the three main energy sources in order of importance.
Oil, gas and coal.

2. Suggest reasons why Venezuela, Libya and Nigeria are not among the top ten oil producers.
Rich reserves; production geared up for export; oil very accessible; lack of tight regulations concerning the impact of oil production on the environment.

3. Using the data in Table 9.1, calculate the amount of oil production that comes from the Middle East.
25,569,000 of barrels per day.

Page 137
What happens when a country’s oil production is interrupted by conflict?
Production declines; overseas markets lost, so loss of revenue.

Page 138
Name a) two major oil and gas regions, and b) two potential oil and gas regions.
 a) Middle East, Gulf of Mexico
 b) the Arctic, Mongolia.

Page 139
Which of the possible environmental impacts of these four unconventional sources of energy do you think is the most serious? Give your reasons.
Tar sands, because their exploitation involves vast open-cast mines, so there is much disfigurement of the landscape, plus possible pollution.

Page 141
1. Suggest ways in which you could save energy in your home.
Turning off lights when not needed; turning down the heating thermostat; turning off computers rather than leaving them in sleep mode; unplugging mobile phones as soon as they have charged; walking to school.

2. How will energy conservation reduce carbon emissions?
Energy conservation will lead to using less energy; using less energy will reduce the burning of fossil fuels to generate that energy; lower carbon emissions.

3. What are the ‘risks and challenges’ associated with nuclear power stations?
Nuclear power stations carry safety risks which could harm human health and the environment. They also produce radioactive waste that is dangerous for many years and so has to be carefully treated and stored. The challenges are to address these risks so that people feel reassured that accidents like Fukushima Daiichi nuclear disaster in 2012 do not reoccur.
Page 142

1. Why is the energy mix so important?
The more sources of energy used, the less vulnerable a country is if the supply of one form of energy is cut off or ceases.

2. Why is energy security increased by a low dependence on imported energy?
Importing energy always exposes a country to the risk of having its supply cut off for geopolitical reasons. The energy supplier is able to hold the country it is supplying to ransom.

3. What is meant by the term ‘carbon footprint’?
The amount of carbon dioxide released into the atmosphere as a result of the activities of an individual, organisation or community.

Page 143

Why do players have different views on energy supply?
It depends on whether they are producers or consumers. Producers or suppliers of energy will be particularly concerned with profit making. Consumers will be most concerned about the cheapness and reliability of energy supplies.

Page 144

How are people being ‘educated’ about the need for energy conservation?
In school; by public service advertising; by grants to encourage making homes more energy efficient.