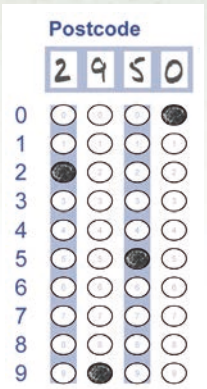
Question Booklet

2014 australian geography competition

INSTRUCTIONS

1. Fill in your **name, school code** (your teacher will give you this), school's **postcode,** your **gender** and **age**. You must fill in the ovals, not just write the letters and numbers, as the computer only reads the ovals. For example, a filled-in postcode (for some other school) would look like the sample on the right. Also fill in an oval in the school assigned column if instructed to do so by your teacher. Otherwise leave it blank.



2. If you are 13 years or under on 31 August 2014 complete Questions 1-30.

3. If you are 14 or 15 years old on 31 August 2014 complete Questions 1-40.

4. If you are 16 to 18 years old on 31 August 2014 complete Questions 16-50.

5. Answer all questions by filling in **only one** oval on the answer sheet corresponding to the most appropriate answer for each question. If you change your mind, you must **erase** the wrong answer so that only one oval is filled in for each question.

6. You have 35 minutes to answer the questions. The time to fill in the preliminary information is extra.

7. Do not mark the front or back of the answer sheet in any other way as this can lead to errors in the computerized marking, or to your not getting a result.

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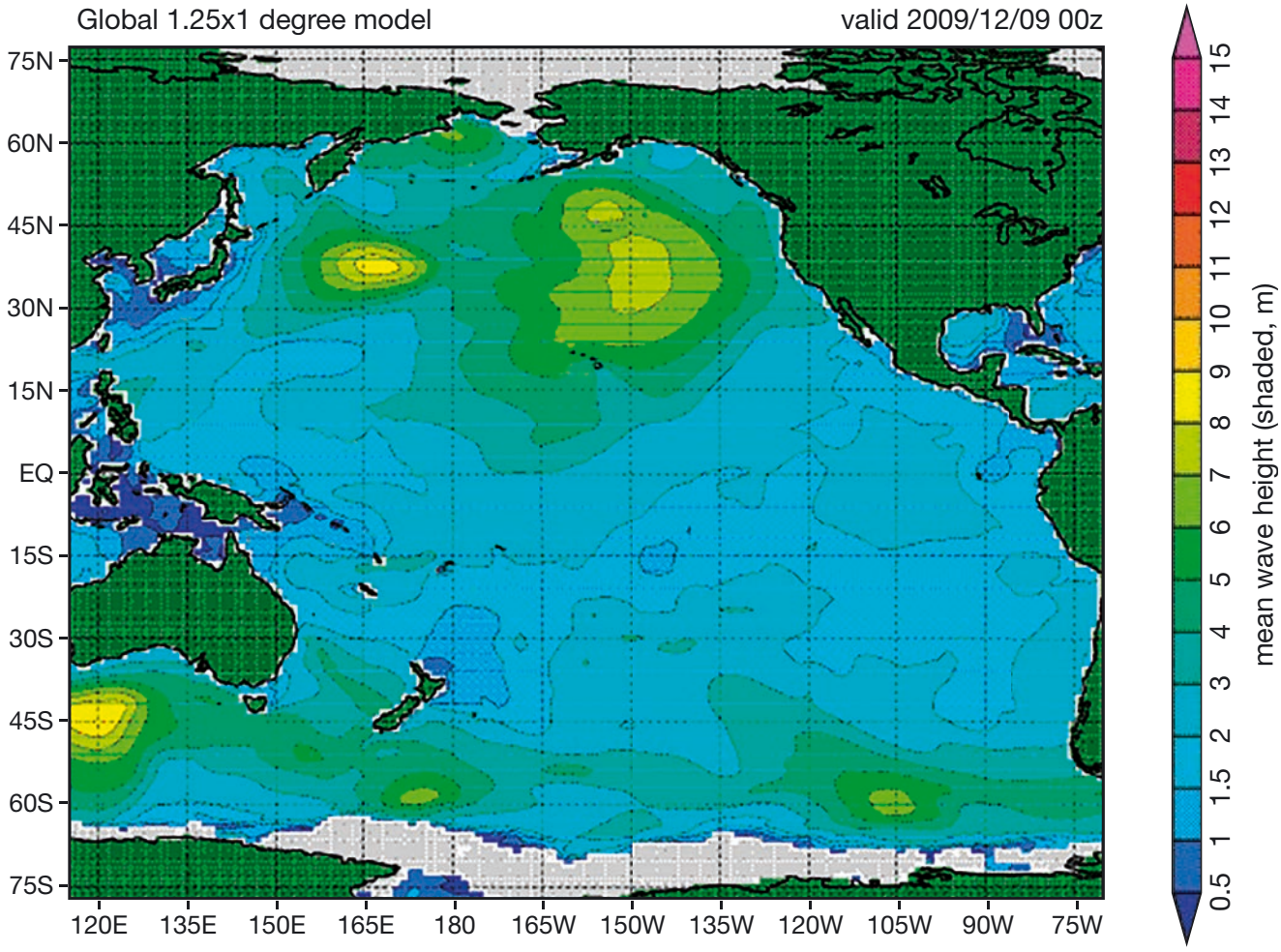


Figure 1. *Mean wave height*

Start at Question 1 if you are **under 16 years** old on 31 August 2014. Start at Question 16 if you are older.

1 What was the highest mean wave height to the south of Australia at the time of the map (Figure 1)?

A 2 to 3 metres
B 4 to 5 metres
C 6 to 7 metres
D 8 to 9 metres
E 10 to 11 metres

2 Where were the highest waves in the Pacific Ocean at the time of the map (Figure 1)?

A east of Japan
B east of Mexico
C south of Alaska
D southeast of New Zealand
E west of Chile

Figure 2. *Location of Cape Carnot*

3 What is the approximate location of Cape Carnot (see Figure 2)?

A 35°N 136°E
B 35°N 136°W
C 35°S 136°E
D 35°S 136°W
E 136°S 35°W

Figure 3. *Cape Carnot, South Australia* *© C Grant*

4 What is the major agent of erosion affecting the rocks at Cape Carnot (see Figure 3)?

A gravity
B ice
C plants
D waves
E wind

5 The bedrock at Cape Carnot (see Figure 3) is gneiss, a hard metamorphic rock resistant to erosion. It formed:

A from cooled intrusions of magma
B from deposits of rock fragments on the sea floor
C when lava cooled on the earth's surface
D when the original rock was changed by heat and pressure
E none of the above

6 Cape Carnot is known for its large wave splash. Its waves are mainly generated by:

A East Coast lows
B land breezes
C northwest monsoons
D Southern Ocean swells
E tropical cyclones

7 Managing wastes sustainably includes the principles of recycle, reduce and:

A relocate
B remote
C reproduce
D retire
E reuse

Figure 4. *Largest of the craters at Henbury, NT. In the 1930s Arrernte elders were recorded as calling the craters* chindu china waru chingi yabu, *roughly translated as 'sun walk fire devil rock'.* *© G Oven*

8 The Henbury craters (see Figure 4) were formed approximately 4,700 years ago by:

A an earthquake
B glacial erosion
C meteorite impact
D volcanic eruption
E water erosion

9 Which type of vegetation is present at the Henbury craters (see Figure 4)?

A desert
B forest
C grassland
D savannah
E woodland

10 The area around the Henbury conservation reserve (see Figure 4) is used for:

A beef cattle
B cotton
C dairy cattle
D rice
E wheat

11 Which answer correctly lists settlements by population size, from smallest to largest?

A city, megacity, homestead, town, village
B homestead, village, town, city, megacity
C megacity, homestead, village, city, town
D town, city, megacity, village, homestead
E village, town, city, homestead, megacity

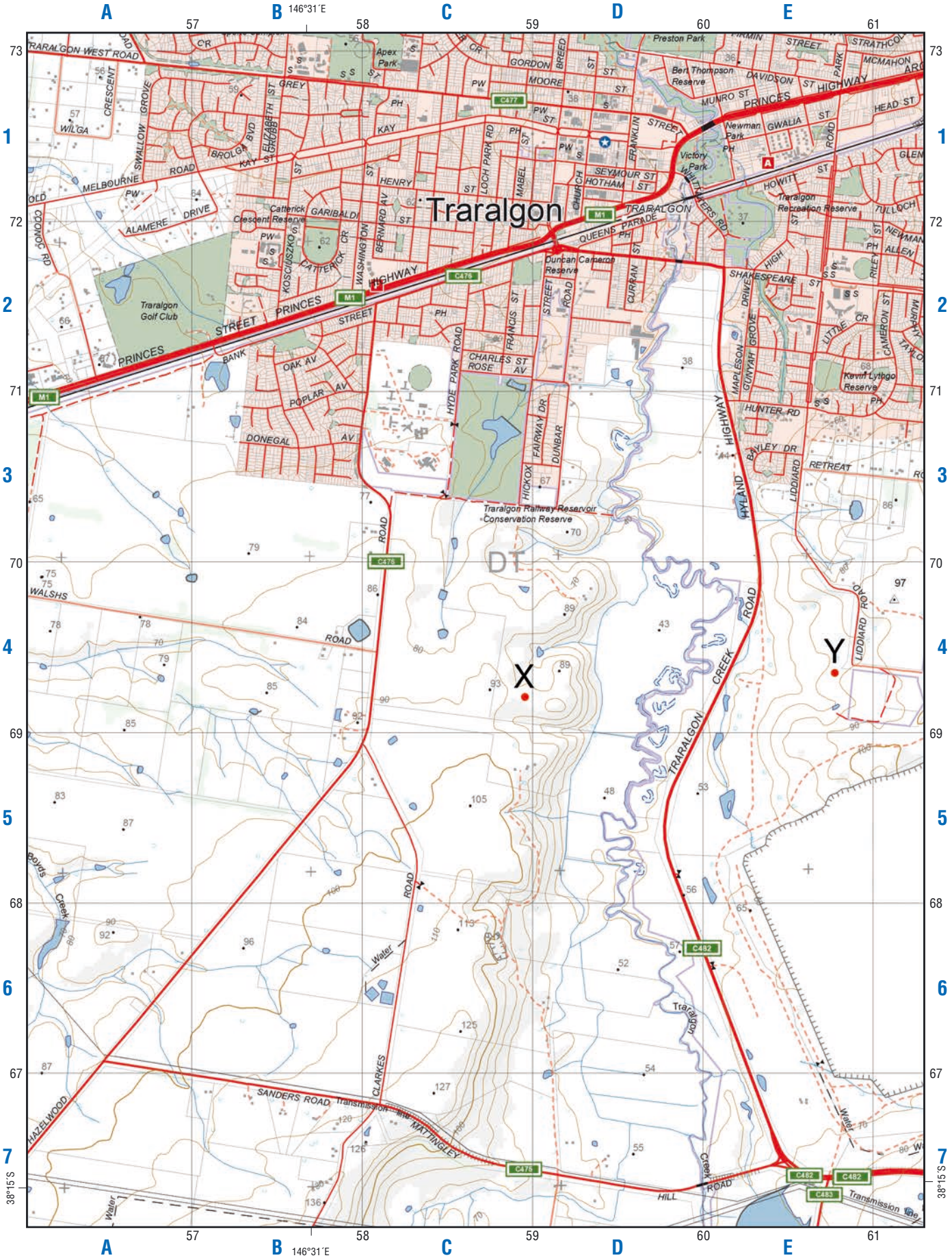
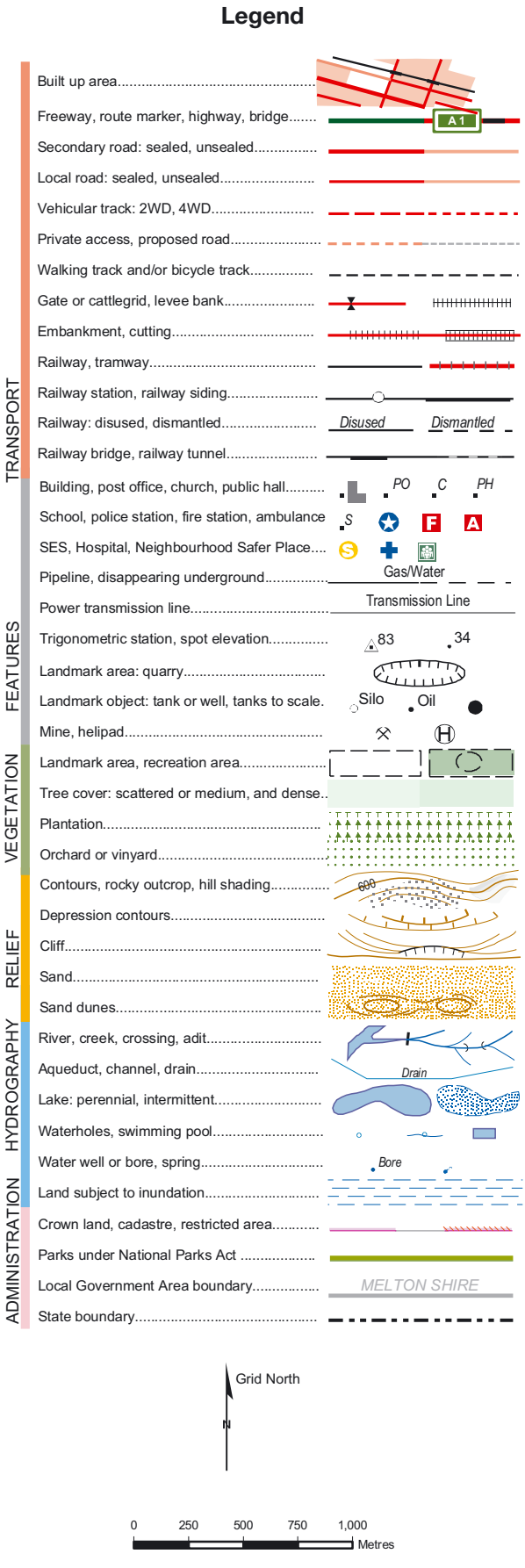


Figure 5. *Topographic map*



10 metre contour interval

12 What is the dominant landcover in the northern third of the map (Figure 5)?

A built up area
B orchard
C recreation area
D sand
E tree cover

13 Clarkes Road (in grid square C6) is a:

A 2WD vehicular track
B highway
C private access road
D sealed local road
E unsealed road

14 What is the approximate distance from Point X (C4) to Point Y (E4) in Figure 5?

A 0.7 km
B 1.8 km
C 2.4 km
D 6.0 km
E 60 km

15 In which general direction does Traralgon Creek flow (see Figure 5)?

A east
B north
C south
D southwest
E west

Start at Question 16 if you are **16** to **18 years** old on 31 August 2014. If you are younger, continue answering questions.

16 Which ratio is closest to the scale of the topographic map (Figure 5)?

A 1:3,000
B 1:30,000
C 1:300,000
D 1:3,000,000
E 1:30,000,000

17 The land use in the southwest part of the map is (see Fig 5 <u>and</u> Fig 6 on next page):

A agriculture
B manufacturing
C mining
D rural residential
E urban

Figure 6. *Landsat-8 satellite image of Traralgon captured 14 January 2014* *© United States Geological Survey*

Open this page out to see the map at the same time.

18 Locate Point A on the satellite image (Figure 6). In which grid square on the topographic map (Figure 5) is this point located?

A C5
B D4
C D5
D E4
E E5

19 Locate the feature marked B on the satellite image (Figure 6). What is this feature identified as on the topographic map (Figure 5)?

A embankment
B levee bank
C quarry
D recreation area
E sand dunes

20 What is the approximate height above sea level at the intersection of Hazelwood Road and Walshs Road (C4 in Figure 5)?

A 75 metres
B 85 metres
C 95 metres
D 105 metres
E 150 metres

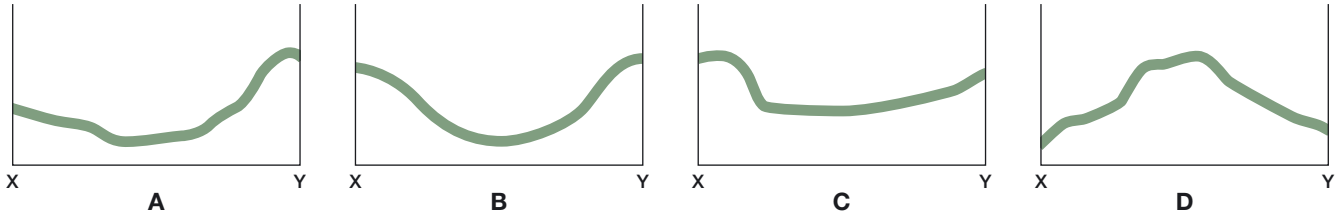


Figure 7. *Sketch profiles*

Fold this page back to see the map at the same time.

21 Which sketch profile in Figure 7 best matches the cross section from Point X (C4) to Point Y (E4) in Figure 5?

A Profile A
B Profile B
C Profile C
D Profile D
E none of the above

22 Which features are located between Traralgon Creek and Traralgon Creek Road in D4 and D5? (Interpret the map yourself; this is not in the Legend.)

A lagoons
B lateral moraines
C oxbow lakes
D reservoirs
E watersheds

23 In 2014 it is the International Year of Small Island Developing States (SIDS). Which of these countries is classified as a SIDS?

A Fiji
B Indonesia
C Japan
D New Zealand
E Vietnam

24 Which of these is <u>not</u> a typical characteristic of a Small Island Developing State?

A large population
B limited resource base
C remoteness
D small size
E vulnerable to external shocks

25 Which economic sector do many Small Island Developing States rely on to bring in foreign exchange income?

A automobile manufacture
B financial services
C forestry
D mining
E tourism

26 Which of these is a hydrological hazard?

A earthquakes
B floods
C landslides
D volcanic eruptions
E all of the above

27 Which of these building materials comes from a renewable resource?

A bricks
B cement
C plastic
D steel
E timber

28 In which of these countries does urban population form the highest percentage of its total population?

A Australia
B China
C Indonesia
D Italy
E United States of America

29 Use of social media is a good example of the geographic concept of:

A interconnection
B place
C scale
D space
E sustainability

Table 1. *Selected* ***January*** *temperature statistics for Australian capital cities* *Source: Bureau of Meteorology*

	Sydney	Melbourne	Brisbane	Perth	Adelaide	Hobart	Canberra	Darwin
Average mean maximum temperature	25.9°C	25.9°C	29.1°C	31.0°C	28.7°C	21.7°C	28.1°C	31.8°C
2014 mean maximum temperature	26.9°C	28.6°C	30.7°C	32.2°C	32.5°C	23.5°C	31.6°C	31.7°C
Average number hot days (≥ 35°C)	0.8	3.6	0.3	7.4	5.6	0.4	2.8	0.2
2014 number hot days (≥ 35°C)	1	6	2	10	12	1	10	2
Highest recorded temperature	45.8°C	45.6°C	39.1°C	45.8°C	46.1°C	41.8°C	42.0°C	36.1°C
2014 highest temperature	36.5°C	43.9°C	38.7°C	43.3°C	45.1°C	38.9°C	40.2°C	36.1°C

30 In January 2014, which capital city recorded the highest temperature (see Table 1)?

A Adelaide
B Brisbane
C Darwin
D Melbourne
E Perth

If you are **under 14 years** old on 31 August 2014 stop at Question 30. If you are older, continue answering questions.

31 Which capital city is the <u>least</u> likely to experience hot days (≥ 35°C) in January (see Table 1)?

A Adelaide
B Canberra
C Darwin
D Hobart
E Sydney

32 From Table 1, which capital city had close to average maximum temperatures in January 2014?

A Brisbane
B Canberra
C Darwin
D Hobart
E Perth

One of the most significant multi-day heatwaves on record affected southeast Australia from 13 to 18 January 2014. A dome of very hot air developed over Western Australia before moving eastwards over the southeast of the continent. A _____ pressure system remained near-stationary over the Tasman Sea from the 13th onwards, before a trough moved across the region on the 17th and 18th, bringing cooler air and ending the heatwave.

Figure 8. *January 2014 heatwave*
Source: adapted from Bureau of Meteorology

33 Which word is missing from the Bureau of Meteorology's description of the January 2014 heatwave, as given in Figure 8?

A heavy
B high
C hot
D light
E low

34 The heat wave in southeast Australia in January 2014 caused:

A dangerous bushfire conditions
B electricity blackouts
C an increase in the number of deaths
D record water use
E all of the above

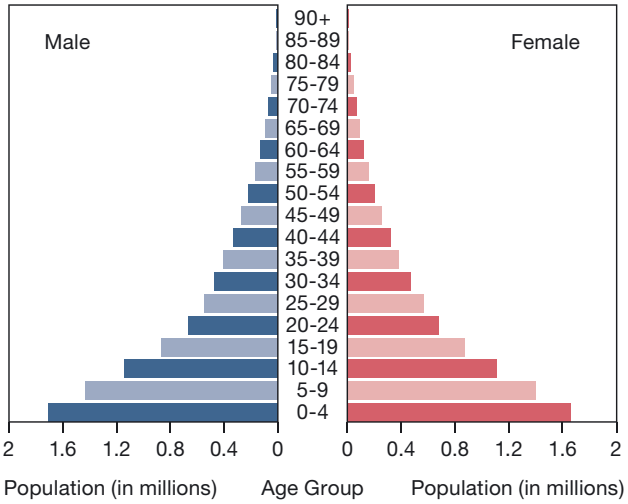


Figure 9. *Population pyramid for Niger, 2013*
Source: United States Census Bureau

35 Approximately how many children aged between 0 and 4 years lived in Niger in 2013 (see Figure 9)?

A 0.4 million
B 0.8 million
C 1.7 million
D 3.4 million
E 4.0 million

36 Based on Figure 9, what is the most accurate way to describe the population of Niger?

A contracting with large families
B expanding with small families
C low growth rate with small families
D rapidly expanding with large families
E stationary with large families

37 Which type of statistic is given in Column C in Table 2?

A commercial
B demographic
C economic
D environmental
E social

38 Which country in Table 2 is Niger, a country in Sub-Saharan Africa?

A Country 1
B Country 2
C Country 3
D Country 4
E Country 5

39 In which region is Country 1 in Table 2?
(Note list of countries in Table title.)

A Europe
B Pacific Islands
C South America
D South Asia
E Sub-Saharan Africa

40 One of the numbers below is Australia's 2012 HDI value. Based on the data in Table 2, what is Australia's value?

A 0.215
B 0.488
C 0.691
D 0.763
E 0.938

If you are **under 16 years** old on 31 August 2014 stop at Question 40. If you are older, continue to the end of the questions.

Table 2. *2012 Human Development Index (HDI) & components for Chile, Fiji, India, Niger, Norway* *Source: UNDP*

	A Life expectancy at birth (years)	B Mean years of schooling	C GNI per capita (Int$) *	D HDI value
Country 1	81.3	12.6	48 688	0.955
Country 2	79.3	9.7	14 987	0.819
Country 3	69.4	10.7	4 087	0.702
Country 4	65.8	4.4	3 285	0.554
Country 5	55.1	1.4	701	0.304

* Gross National Income per capita measured in 'international dollars', a hypothetical currency for international comparisons.

The quality of water entering the Great Barrier Reef World Heritage Area has deteriorated over the past 100 years, with a detrimental effect on marine ecosystems. Over the past 10 years, significant efforts have been made to improve the quality of water entering the Reef through monitoring and management of adjoining catchments. The Figures and Tables given here relate to two of these catchments – the Burdekin and the Pioneer.

Figure 10. *Introduction to Q41 - Q50*

Table 3. *Characteristics of Burdekin and Pioneer catchments*

Source: Australian Centre for Tropical Freshwater Research

	Burdekin	Pioneer
Area (km^2)	130 035	1 687
Stream length (km)	13 949	248
Mean annual flow (Gl/yr)	7 595	946
Rainfall (mm)	500-1000	1200-2500

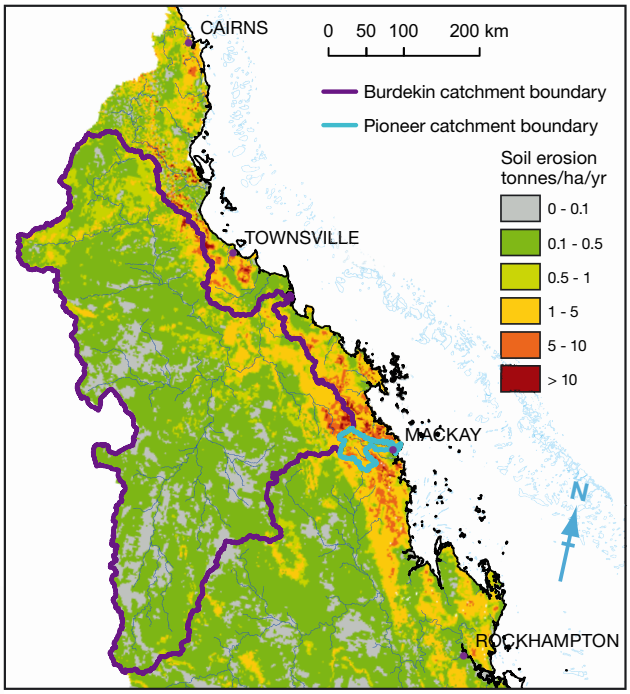


Figure 11. *Soil erosion under natural conditions (modelled)*

Source: Australian Centre for Tropical Freshwater Research

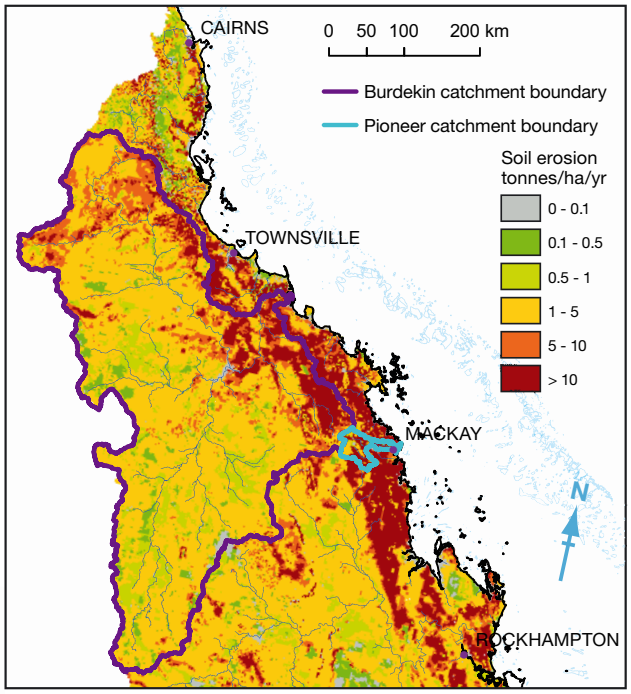


Figure 12. *Current soil erosion (modelled)*

Source: Australian Centre for Tropical Freshwater Research

Table 4. *Contribution of land uses in the Burdekin and Pioneer catchments to sediment exports to coast*

Source: Australian Centre for Tropical Freshwater Research

	Burdekin Catchment					Pioneer Catchment				
	Forest/ savannah	Grazing	Sugar	Other crops	Other	Forest/ savannah	Grazing	Sugar	Other crops	Other
Area (km^2)	4 938	123 758	128	742	469	625	548	455	1	58
% of area (rounded)	4	95	0	1	0	37	32	27	0	3
Sediment exports (kilotonnes/yr)	226	2 533	36	6	15	100	130	160	0	16
% of sediment exports (rounded)	8	90	1	0	1	25	32	39	0	4

Table 5. *Erosion characteristics of the Burdekin and Pioneer catchments*

Source: Australian Centre for Tropical Freshwater Research

	Burdekin Catchment		Pioneer Catchment	
	Natural	Current	Natural	Current
Total erosion (kilotonnes/yr)	780	11 536	59	553
Hillslope erosion as % of total	84	49	92	93
Gully erosion as % of total	0	44	0	3
Riverbank erosion as % of total	16	7	8	4
Total sediment exported to coast (kilotonnes/yr)	478	2 816	50	406

For Questions 41-50, use Figures 10 to 12, Tables 3 to 5, and your own knowledge.

41 What would be the main reason for the differences in erosion rates shown in the two maps?

A change of land use
B El Niño
C establishment of national parks
D global warming
E location of cities in the catchment

42 Looking at the two maps, which statement is correct?

A Areas with the highest erosion rates are centred around Cairns.
B The highest erosion rates occur in the upper reaches of the rivers.
C Most areas with the highest erosion rates are within 100 km of the coast.
D Prior to European settlement, most of the area had erosion rates higher than 1 tonne/ha/yr.
E There are currently no areas with erosion rates of less than 0.5 tonne/ha/yr.

43 Which of these has the <u>least</u> influence on rates of erosion?

A rainfall
B relief
C soil type
D temperature
E vegetation cover

44 Look at the data in Table 5 on total erosion in the Burdekin catchment, under natural conditions and currently. The increase in total erosion is closest to:

A 80%
B 140%
C 800%
D 1000%
E 1400%

45 Which of these statements is consistent with the data in Table 5?

A The amount of sediment caused by riverbank erosion has decreased by approximately 50% in both catchments.
B Approximately 553 kilotonnes/yr of sediment are currently produced by hillslope erosion in the Burdekin catchment.
C Most of the eroded material in the Burdekin catchment currently reaches the sea.
D The sediment produced by hillslope erosion in the Pioneer catchment has changed very little over time.
E Total sediment exports to the coast have increased by approximately 8 times in the Pioneer catchment.

46 Which of these delivers the greatest amount of sediment to the coast (see Table 4)?

A forest/savannah in the Burdekin
B forest/savannah in the Pioneer
C grazing in the Burdekin
D grazing in the Pioneer
E sugar in the Pioneer

47 Which of these delivers the greatest amount of sediment to the coast per km^2?

A forest/savannah in the Burdekin
B forest/savannah in the Pioneer
C grazing in the Burdekin
D grazing in the Pioneer
E sugar in the Pioneer

48 Suspended sediment is a serious problem in Reef waters primarily because it:

A causes deformities in marine organisms
B encourages outbreaks of coral-eating starfish
C leads to seagrass beds encroaching on corals
D reduces light reaching corals and seagrasses
E stops fish breeding

49 A much smaller proportion of eroded material from the Burdekin catchment reaches the sea, than from the Pioneer catchment. What would be the main reason for this?

A The Burdekin catchment is primarily grazing land.
B The Burdekin has a larger floodplain and delta.
C The Pioneer catchment has lower relief.
D The Pioneer has a larger volume of water flowing out to sea.
E The Pioneer River is dammed in its lower reaches.

50 Of these options, which is likely to be the most cost-effective and sustainable way to reduce total erosion in the two catchments?

A changing irrigation methods on sugar cane farms in the Pioneer catchment
B planting forests over all the grazing lands of the Burdekin catchment
C revegetation of gully areas in the Burdekin catchment
D sediment trap across the mouth of the Burdekin
E tree planting to control riverbank erosion on the Pioneer

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