Government of South Australia

SACE Board of SA

External Examination 2012

2012 GEOGRAPHY

ATTACH SACE REGISTRATION NUMBER LABEL TO THIS BOX

Tuesday 13 November: 9 a.m.

Time: 2 hours

Pages: 22
Questions: 23

Core Topic: Population, Resources, and Development

Examination material: one 22-page question booklet
one single-sided map sheet
one SACE registration number label

Approved dictionaries and calculators may be used.

Instructions to Students

1. You will have 10 minutes to read the paper. You must not write in your question booklet or use a calculator during this reading time but you may make notes on the scribbling paper provided.
2. This paper consists of 23 short-answer and extended-answer questions.
   Answer ***all*** questions in the spaces provided in this booklet.
3. The total mark is 60.
4. Attach your SACE registration number label to the box at the top of this page.

STUDENT'S DECLARATION ON THE USE OF CALCULATORS

By signing the examination attendance roll I declare that:

- my calculators have been cleared of all memory
- no external storage media are in use on these calculators.

I understand that if I do not comply with the above conditions for the use of calculators I will:

- be in breach of the rules
- have my results for the examination cancelled or amended
- be liable to such further penalty, whether by exclusion from future examinations or otherwise, as the SACE Board of South Australia determines.

The examination questions begin on page 4.

*Answer **all** the questions. Write your answers in the spaces provided after each question.*

Refer to the topographic map SOUTH CANTERBURY (Map A), scale 1:250 000, on the separate map sheet, where appropriate, when answering Questions 1 to 6.

1. How far is it by rail (to the nearest kilometre) from Winchester (map coordinate E4) to the crossroads at Ealing (map coordinate F6)?

   _____ kilometres (1 mark)

2. A train travelling from Belfield (map coordinate E5) to Rangitata (map coordinate E5) would be heading in which *one* of the following directions? Tick the appropriate box.

   North-east ☐ North-west ☐ South-east ☐ South-west ☐ (1 mark)

3. The latitude and longitude of Timaru (map coordinate E2) indicates that this town is within 10º of which *one* of the following key lines of the Earth's geographic grid? Tick the appropriate box.

   Equator ☐

   International Date Line ☐

   Meridian of Greenwich ☐

   Tropic of Capricorn ☐ (1 mark)

4. Which *one* of the following methods is ***not*** used to represent relief in the area of Four Peaks Range (map coordinates B6 and C7)? Tick the appropriate box.

   Contours ☐

   Spot heights ☐

   Layer tinting ☐

   Hill shading ☐ (1 mark)

5. (a) In 1992, a dam wall (map coordinate B6) was constructed to form Lake Opuha and help meet irrigation needs downstream. Explain why this was a suitable site to build a dam wall for this purpose.

_____

_____

_____ (1 mark)

(b) Water released from Lake Opuha may be discharged at the coast via which watercourse?

_____ (1 mark)

6. *Refer to Box* **P** *and Box* **Q** *on Map A.*

Describe and explain the difference between the arrangement of the roads in Box **P** and that of the roads in Box **Q**.

_____

_____

_____

_____

_____ (2 marks)

Refer to the topographic map PLEASANT POINT (Map B), scale 1:50 000, on the separate map sheet, where appropriate, when answering Question 7 below and Question 8 on page 6.

7. Explain the difference between a renewable and a non-renewable resource by comparing the human activities at **U** (grid reference 514893) and **W** (grid reference 539884).

_____

_____

_____

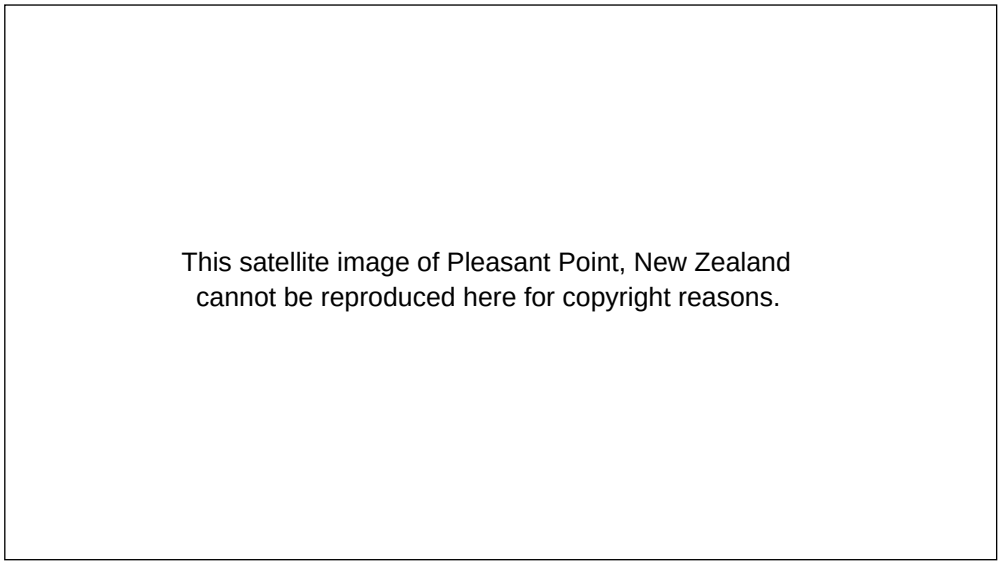
_____

_____

_____ (2 marks)

8. *Refer to the following satellite image and to Map B on the separate map sheet:*

Pleasant Point township and vicinity



Source: Google Maps © Google, viewed 20 July 2012

(a) To the nearest square kilometre, what is the size of the built-up area at Pleasant Point?

_____ sq. km (1 mark)

(b) Explain how the nature of the ground surface influences the rate of run-off and rate of infiltration by referring to *two* specific types of land use in the area of the satellite image.

_____

_____

_____

_____

_____

_____ (2 marks)

Refer to Map A and Map B on the separate map sheet, where appropriate, when answering Questions 9 and 10.

9. Describe and explain the extent to which access to Pleasant Point from Temuka (map coordinates D3 to E3 on Map A) has been influenced by the physical environment of the vicinity.

_____

_____

_____

_____

_____ (2 marks)

10. *Refer to the airport (grid reference 585835) and the motor raceway (grid reference 566837) on Map B and to these same features in Box* **M** *on Map A.*

(a) Compare the way that these features are represented on Map A with the way that they are represented on Map B.

_____

_____

_____ (1 mark)

(b) Explain why these features are represented differently on Map A and Map B.

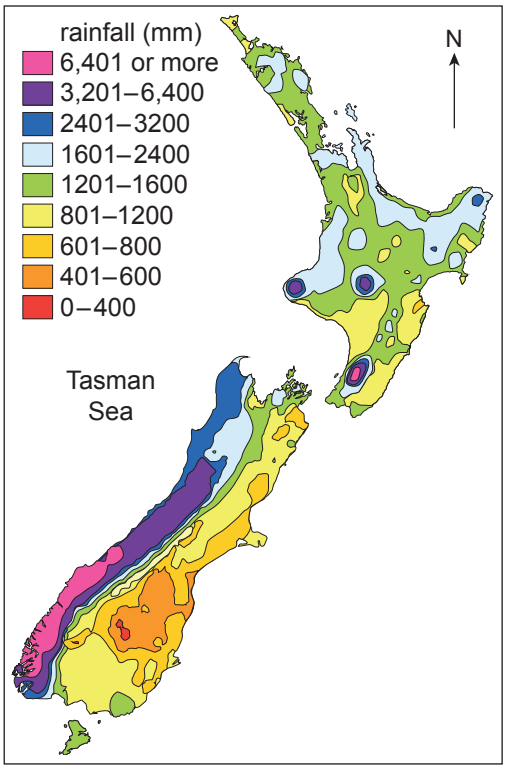
_____

_____

_____ (1 mark)

11. *Refer to the following information where appropriate:*

Map 1 New Zealand average rainfall



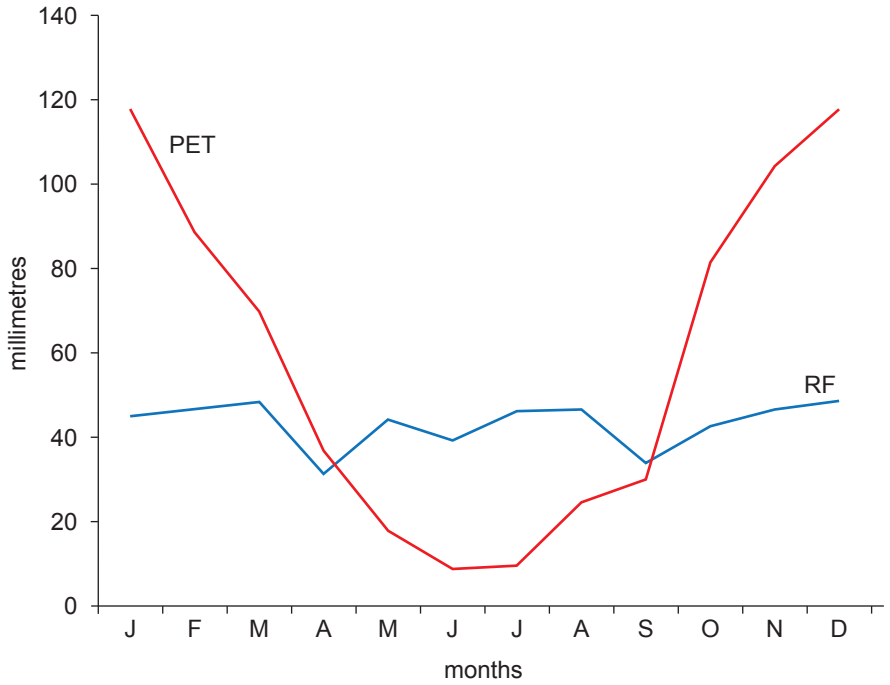
Source: Heiler, T. 2011, 'Irrigation and drainage', Te Ara — the Encyclopedia of New Zealand, updated 27 September, www.teara.govt.nz/en/irrigation-and-drainage/1/2

Map 2 New Zealand relief

This relief map of New Zealand cannot be reproduced here for copyright reasons.

Source: Adapted from Wards, I. (ed.) 1976, *New Zealand Atlas*, Government Printer, on AccessScience website, McGraw-Hill

Average monthly rainfall (RF) and potential evapotranspiration (PET) typical of the South Canterbury Plain



Source: Data taken from Meridian Energy Limited, 2006, 'Hunter Downs Irrigation Scheme Annexure D — Water Demand and Water Use Efficiency', Glasson Potts Fowler Limited, Christchurch, NZ, p. 9

(a) There is a zone in New Zealand's South Island that receives less than 800 mm of rain per annum. With reference to processes that take place in the water cycle and to the information on page 8, explain why this zone has such a low rainfall.

_____

_____

_____

_____

_____ (2 marks)

(b) (i) From the graph, determine the average rainfall for the month of June in the South Canterbury Plain.

_____ millimetres (1 mark)

(ii) Explain why the graph is a better tool than Map 1 for assessing the need for, and the management of, irrigation in the South Canterbury Plain.

_____

_____

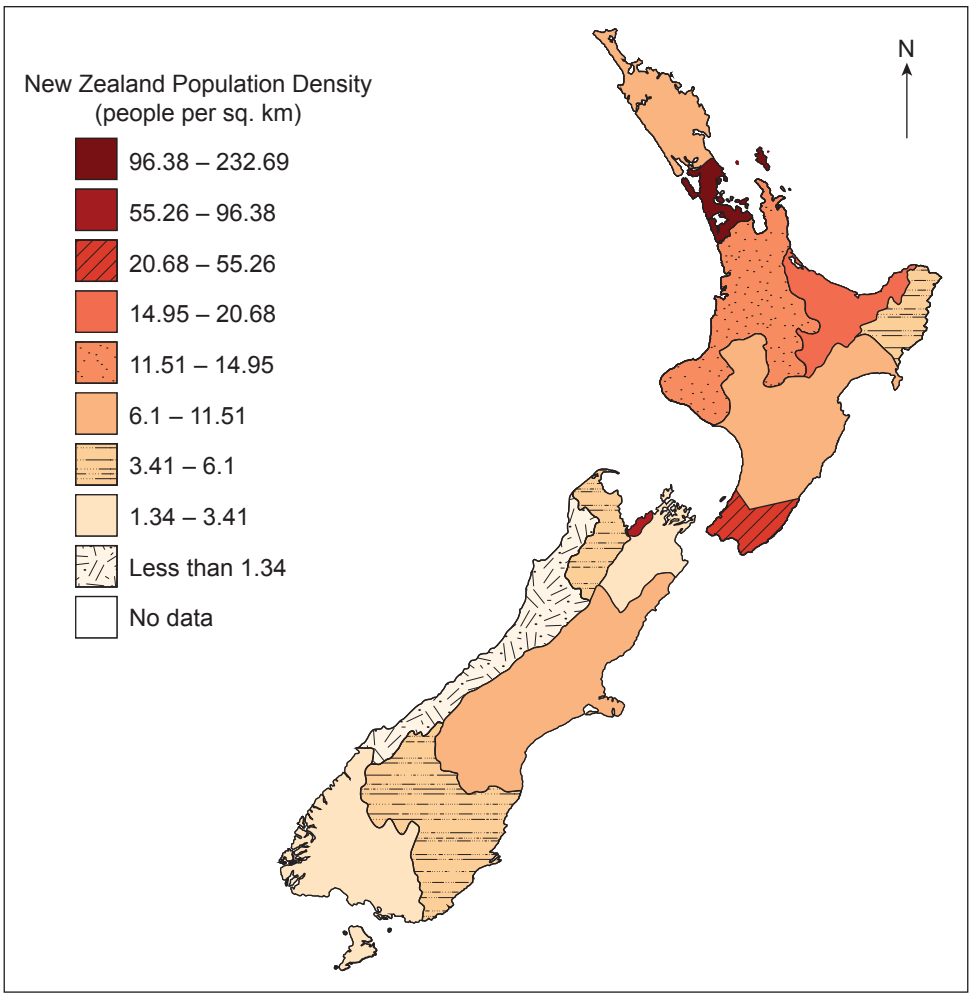
_____

_____

_____ (2 marks)

12. *Refer to the following population density map of New Zealand, the relief map of New Zealand on page 8, and Map A on the separate map sheet where appropriate:*

Population density of New Zealand (2006)



Source: Adapted from Statistics New Zealand, 'New Zealand Population Density', 2006 Census data, © ChartsBin.com

(a) What is the population density range of the area shown on Map A?

_____ (1 mark)

(b) How does relief influence the population density of the North Island compared with the South Island?

_____

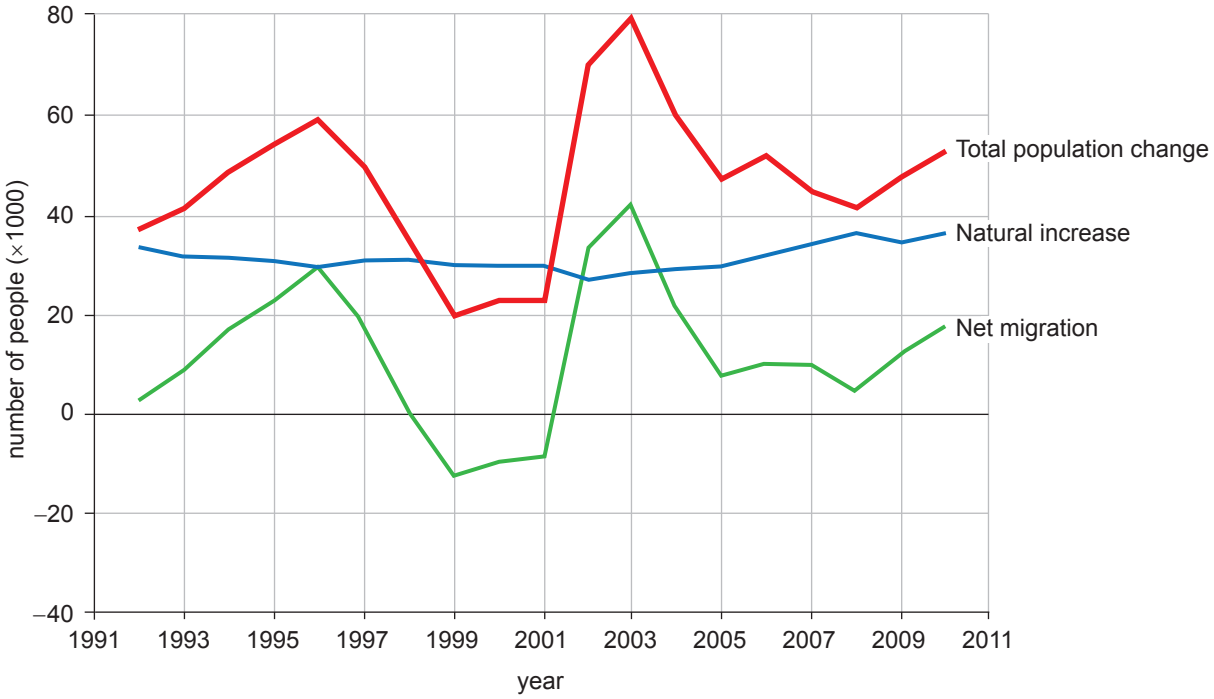
_____

_____ (1 mark)

No further questions refer to the separate map sheet.

13. *Refer to the following graphs:*

Components of population change in New Zealand (1992–2010)



Source: Adapted from Statistics New Zealand, 'Demographic Trends: 2010', licensed for re-use under the 'Creative Commons Attribution 3.0 New Zealand' licence

Which *two* of the following statements about New Zealand's population can be concluded from the graphs? Tick *two* appropriate boxes.

The number of births and the number of deaths were approximately equal between 1999 and 2010. ☐

The population did not grow between 2003 and 2005. ☐

Incoming migration was greater than outgoing migration in 1996. ☐

Trends in total population change between 1992 and 2010 were influenced more by net migration than by natural increase. ☐

The fastest population growth occurred between 1992 and 1996. ☐

(2 marks)

14. *Refer to the table below and the map of poverty in India on page 13 when answering questions (a) and (b). Some of the data used to create the map is in the table:*

Rural and urban poverty for selected states of India (2009–10)

State	Rural (%)	Urban (%)	Combined (%)
Andaman and Nicobar Islands	0.4	0.3	0.4
Andhra Pradesh	22.8	17.7	21.1
Arunachal Pradesh	26.2	24.9	25.9
Assam	39.9	26.1	37.9
Bihar	55.3	39.4	53.5
Chhattisgarh	56.1	23.8	48.7
Dadra and Nagar Haveli	55.9	17.7	39.1
Delhi	7.7	14.4	14.2
Goa	11.5	6.9	8.7
Gujarat	26.7	17.9	23.0
Haryana	18.6	23.0	20.1
Himachal Pradesh	9.1	12.6	9.5
Jammu and Kashmir	8.1	12.8	9.4
Jharkhand	41.6	31.1	39.1
Karnataka	26.1	19.6	23.6
Kerala	12.0	12.1	12.0
Lakshadweep	22.2	1.7	6.8
Madhya Pradesh	42.0	22.9	36.7
Maharashtra	29.5	18.3	24.5
Manipur	47.4	46.4	47.1
Meghalaya	15.3	24.1	17.1
Punjab	14.6	18.1	15.9

Source: Adapted from '2009–10 Poverty Percentage State Wise', updated 21 March 2012, © Maps of India.com

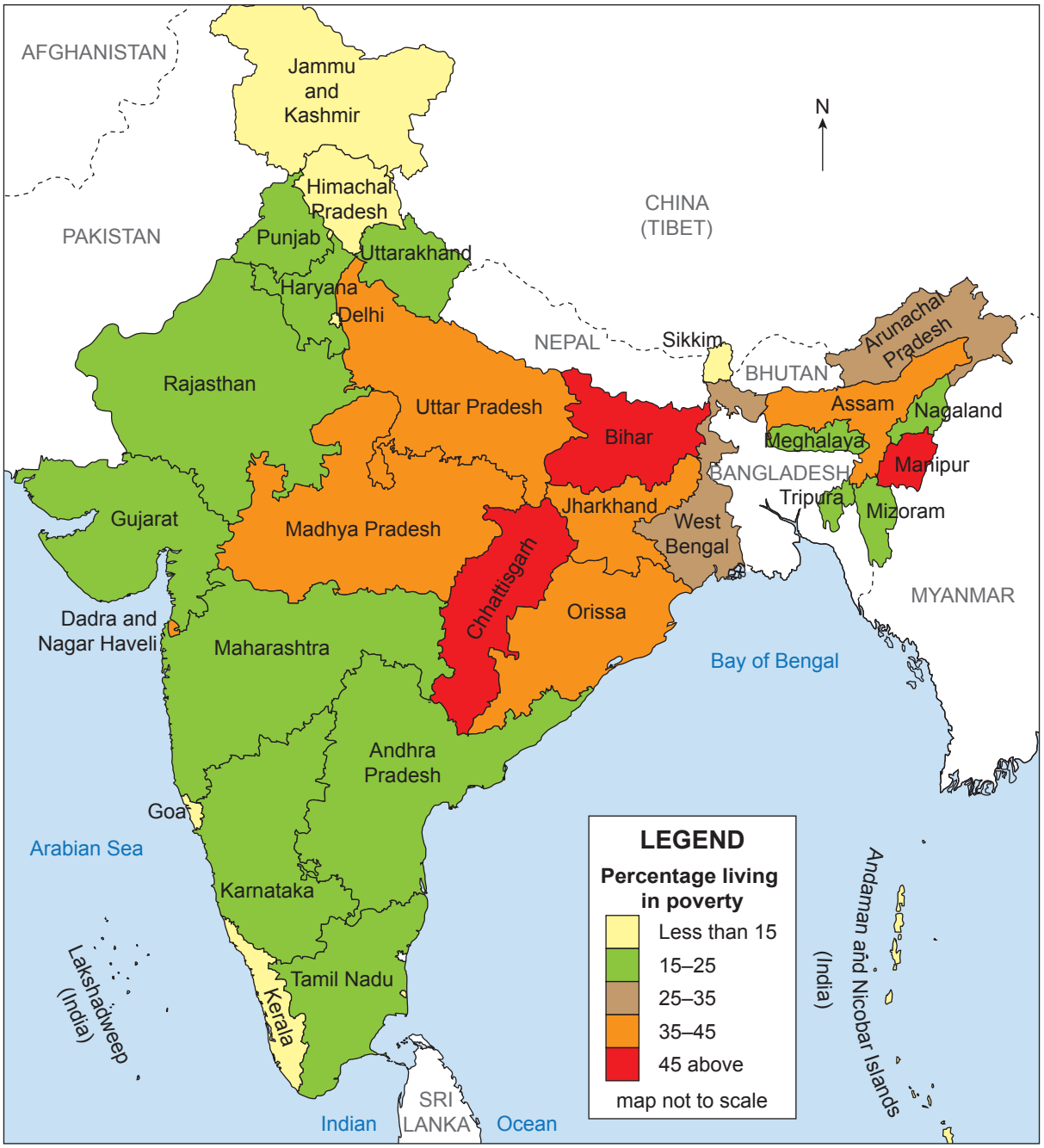
(a) (i) Identify *one* piece of attribute data from the table.

_____ (1 mark)

(ii) Identify *one* piece of locational data from the map.

_____ (1 mark)

Geographical information system (GIS) map of poverty in India (2009–10)



Source: Adapted from 'India Poverty Map 2009–10', updated 21 March 2012, © Maps of India.com

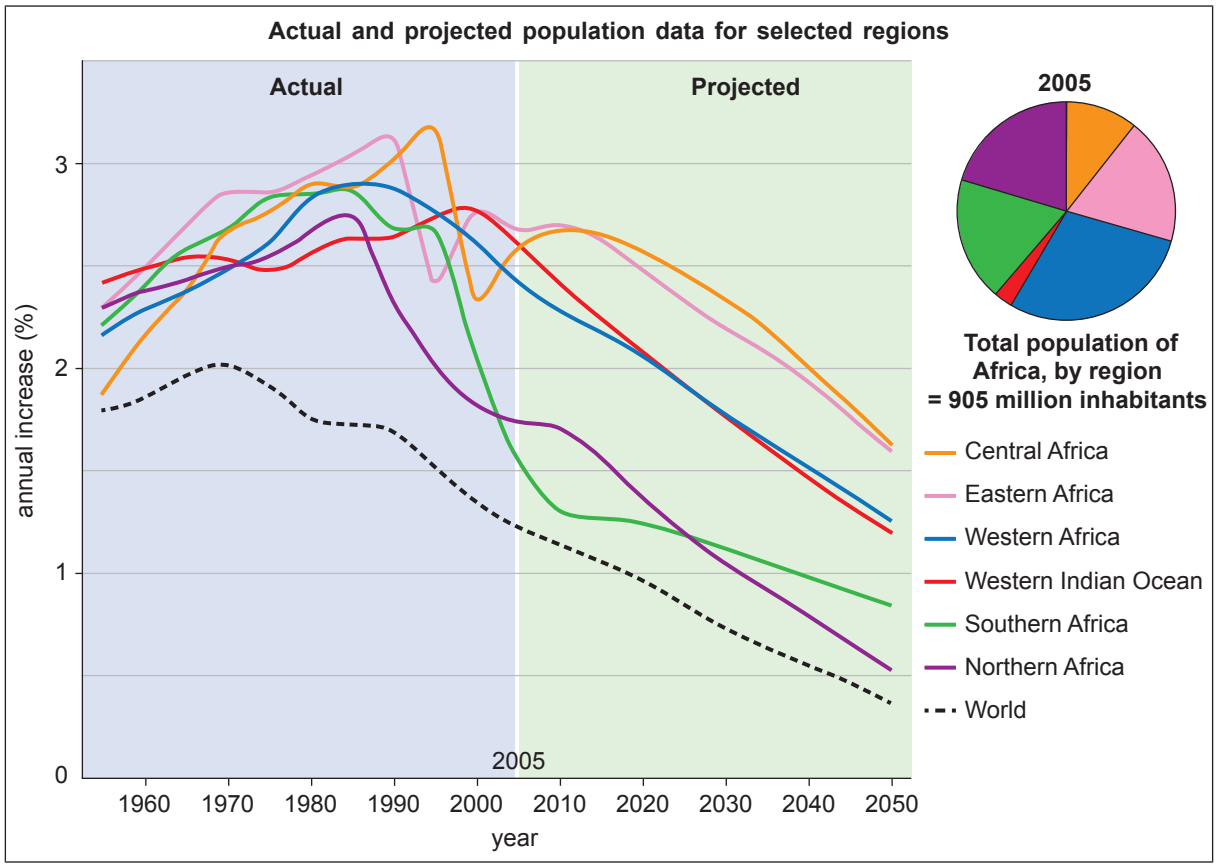
(b) State *one* way in which the GIS map may be used by the government of India in economic planning.

_____

_____

_____ (1 mark)

15. *Refer to the following graphs and pie chart:*



Source: Adapted from Ahlenius, H. 2006 'Population and growth, projections and historic data', African Environment Collection, © UNEP/GRID-Arendal

(a) According to the graph, when was the growth of world population at a maximum?

_____ (1 mark)

(b) What is the projected trend in Africa's population after 2020? Tick the appropriate box.

Fluctuating growth rates in most regions.	☐
A decline in population growth rates in some regions.	☐
A decline in population growth rates in all regions.	☐
Lack of a clear trend in population growth rates in all regions.	☐

(1 mark)

(c) Describe the distribution of the population of Africa by region in 2005.

_____

_____

_____ (1 mark)

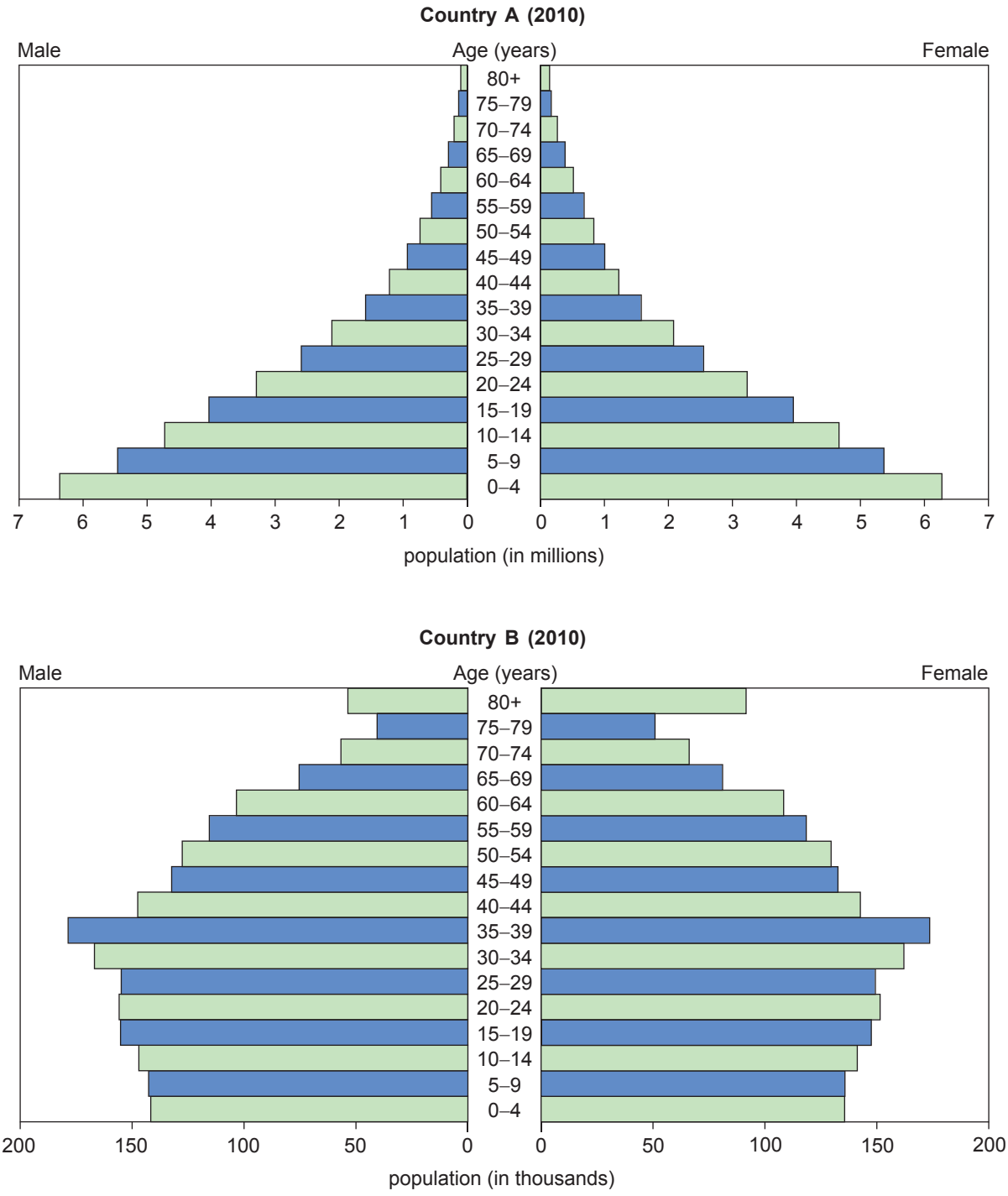
16. Explain the influence of *one* of the following factors on the population distribution in a region of your choice: culture, history, politics, or resources.

(1 mark)

17. With reference to countries or regions at different levels of development, describe and explain the factors that have caused a decline in the growth of world population.

(5 marks)

18. *Refer to the following population pyramids:*



Source: Adapted from US Census Bureau, International Data Base, © NationMaster.com

(a) Match the population pyramids for Country A and Country B to the correct descriptions below by writing 'A' or 'B' in the spaces provided.

Country with an ageing population _____

Country with a rapidly growing population _____ (1 mark)

(b) Match each of the following statements to either Country A or Country B by writing 'A' or 'B' in the spaces provided.

Statement	*A or B*
A woman returns to full-time paid work after the birth of her second and final child.	
Four infants from one family die.	
The local community celebrates as clean water flows from the first tap in the village.	
The local toy shop has closed, but senior citizens clubs are full.	

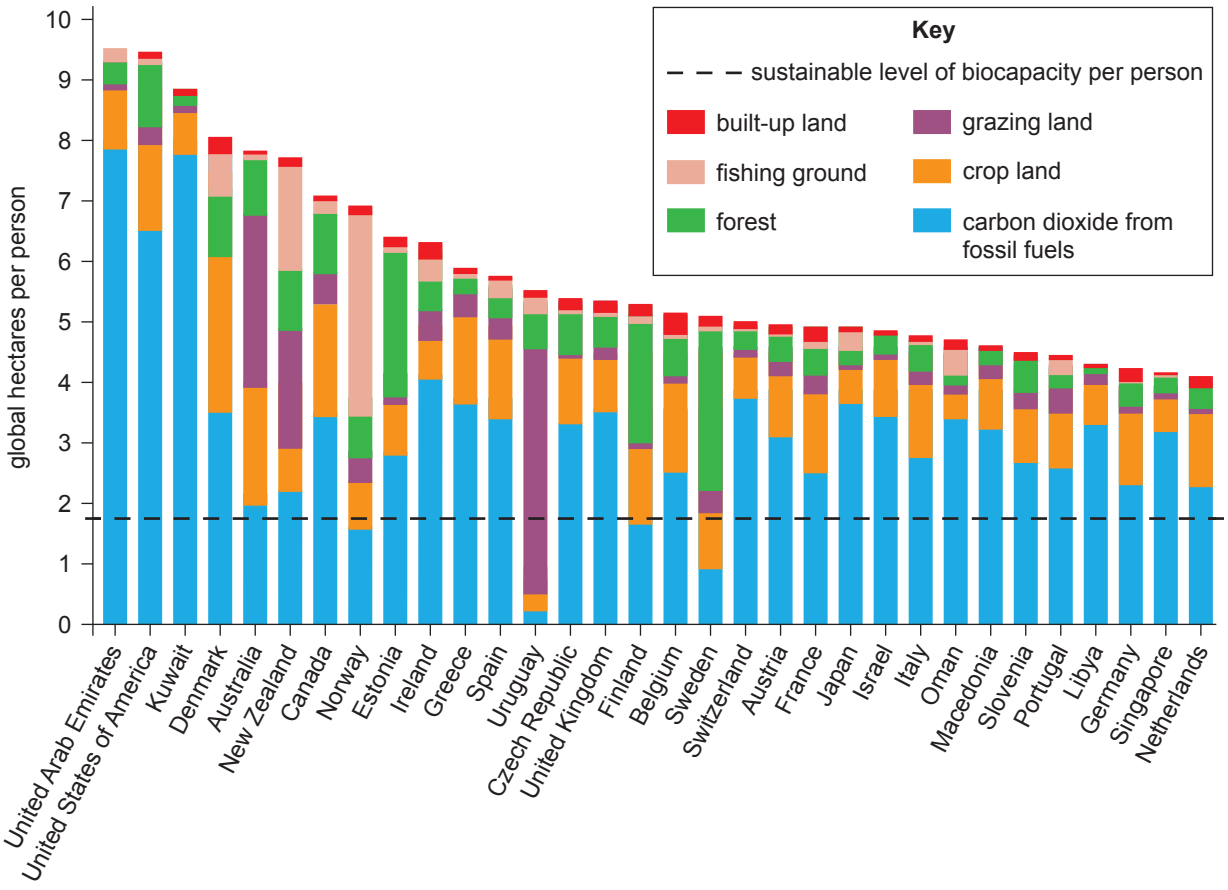
(2 marks)

(c) Compare the issues facing countries that have ageing populations with those facing countries that have rapidly growing populations. In your answer, refer to countries you have studied.

(4 marks)

19. *Refer to the following graph where appropriate:*

Composition of ecological footprint of a range of countries, 2005



Source: Adapted from WWF, 2008, *Living Planet Report 2008*, World Wide Fund for Nature, Gland, Switzerland, p. 14

(a) Which country's footprint has the highest proportion of grazing land?

_____ (1 mark)

(b) Which country has less than 10% of its footprint made up of carbon dioxide from fossil fuels?

_____ (1 mark)

(c) Suggest how high levels of carbon dioxide could increase a country's biocapacity.

_____

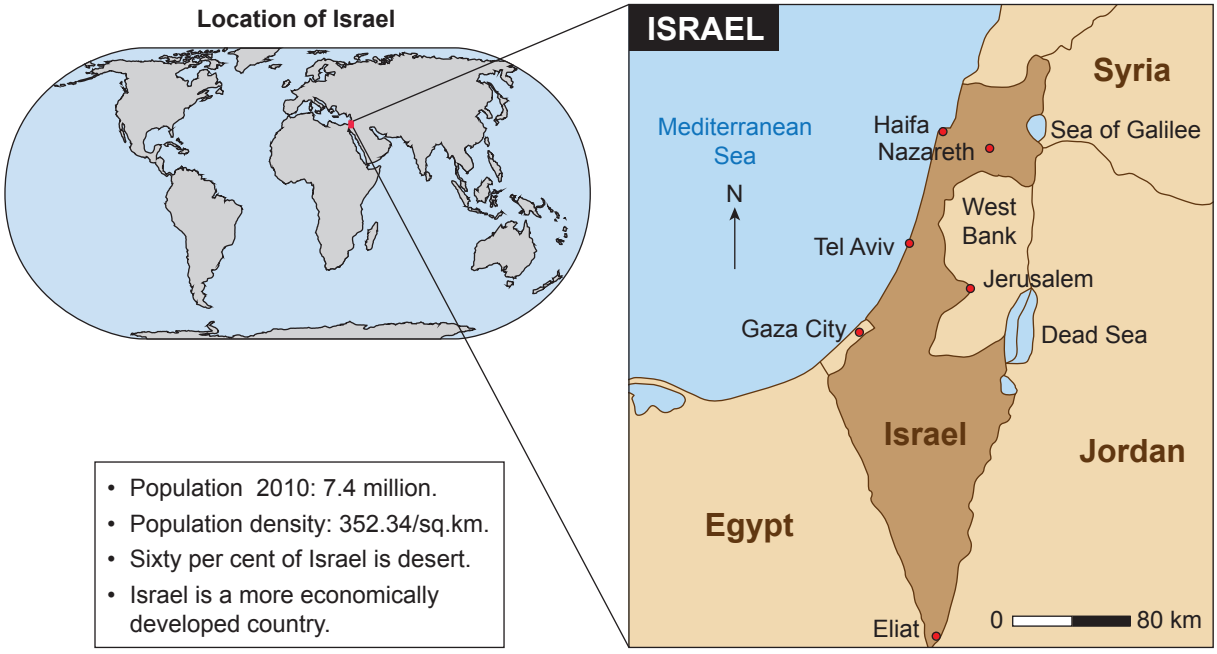
_____

_____ (1 mark)

(d) The graph shows that countries with broadly similar levels of development may have significantly different ecological footprints in terms of size and composition. Explain *two* factors that could be responsible for these differences.

(4 marks)

Refer to the maps and tables below and the graph opposite, where appropriate, when answering Questions 20 to 23.



Source: Based on 2012, 'Map of Israel', viewed 24 July, © Lonely Planet

Population and selected water supply data for Israel (1998–2020)
[million cubic metres (Mm3)]

Year	*Population (millions)*	*Desalination (Mm3)*	*Treated Effluent (Mm3)*
1997	5.8	10	275
2010	7.4	100	470
Predicted 2020	8.6	200	565

Source: Shevah, Y. 1982, 'Israel' in Framji, K.K., Garg, B.C., & Luthra, S.D.L. (eds) *Irrigation and Drainage in the World — A Global Review* Vol. II, third edition, International Commission on Irrigation and Drainage (ICID), New Delhi, India

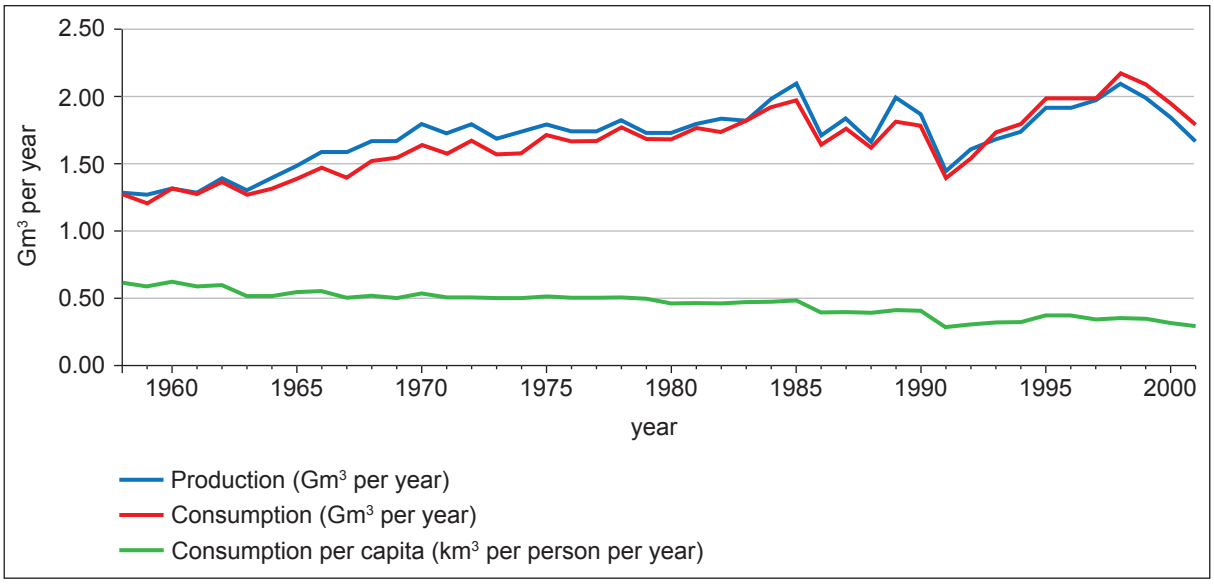
Israel water fact file

Israel:

- has the world's largest and most cost-efficient desalination plant (approximately US$0.52 per m^3)
- desalinates 50% of its consumed water
- has the highest rate of water recycling in the world at 80%
- invented drip irrigation enabling the world's highest (70–80%) rate of water efficiency in agriculture
- uses 52% of all water consumed in Israel for agriculture; 54% of this is drinking quality
- has, over the past 25 years, increased agricultural output with limited increase in the amount of water used
- treats a significant amount of all sewage to produce good-quality, treated effluent to irrigate crops without restrictions or risk to public health.

Source: Adapted from 2012, 'Water in Israel: A global leader in resource management', updated 24 June, © InvestinIsrael.com, and Shevah, Y. 1982, 'Israel' in Framji, K.K., Garg, B.C., & Luthra, S.D.L. (eds) *Irrigation and Drainage in the World — A Global Review* Vol. II, third edition, International Commission on Irrigation and Drainage (ICID), New Delhi, India

Historical trends in production and consumption of water in Israel 1958–2001



Source: Data from Demand Management Division, 2002, 'Water in Israel — Consumption and Production, 2001', Water Commission, Ministry of National Infrastructures, The State of Israel, pp. 14–15, 24, and CBS, *Statistical Abstract of Israel 2010*, Israel Central Bureau of Statistics, pp. 85–6

20. (a) Identify a year in which water use in Israel was unsustainable.

_____ (1 mark)

(b) Despite the decline in consumption per capita, the long-term sustainability of water supplies in Israel is under threat. Why?

_____

_____

_____ (1 mark)

21. From the information provided, identify *two* sustainable environmental practices used in Israel, other than recycled effluent.

_____

_____

_____

_____ (2 marks)

22. *Refer to the following images*:

Crops growing under plastic tunnelling in Israel

This image of cannot be reproduced here for copyright reasons. It can be found at

http://www.mfa.gov.il/MFA/History/Modern%20History/Israel%20at%2050/Israeli%20Agriculture-%20Coping%20with%20Growth

Source: Omoding, C. 2008, 'Lessons from Israel's agricultural sector: The New Vision', August, AgriSupportOnline, Moshav Almagor, Israel

This image of cannot be reproduced here for copyright reasons. It can be found at

http://agrisupportonline.com/Articles/agriculture_in_the_desert_israel.htm

Source: Fedler, J. 2002, 'Israeli Agriculture: Coping with Growth', 12 June, Israel Ministry of Foreign Affairs, The State of Israel

Suggest *two* reasons why the environment inside the plastic tunnels might be more favourable for growing crops than the environment outside.

_____

_____

_____

_____

_____ (2 marks)

23. When considering long-term sustainability, suggest *two* reasons why recycling effluent could be preferred to desalination.

_____

_____

_____

_____

_____ (2 marks)

GEOGRAPHY 2012

ACKNOWLEDGMENT

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Question 18, page 16: Both graphs were adapted from US Census Bureau, International Data Base, C NationMaster.com (http://www.nationmaster.com/country/cg-congo-democrativ-republic-of/Age-_distribution)

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The original document can be found at
http://awsassets.wwf.org.au/downloads/mc034_g_living_planet_report_2008_29oct08.pdf

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