

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

INTERNATIONAL A-LEVEL GEOGRAPHY

UNIT 3 PHYSICAL GEOGRAPHY 2

Date of Exam

Session

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a ruler with millimetre measurements
- a calculator, which you are expected to use where appropriate.

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of the page.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
Do not write outside the box around each page or on blank pages.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may use a bilingual dictionary for this exam.
- You may **not** use an English dictionary.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

Section A – Water Carbon and Life on Earth

Answer **all** questions in the spaces provided

Only **one** answer per question is allowed.

For each answer completely fill in the circle alongside the appropriate answer.


CORRECT METHOD



WRONG METHODS



If you want to change your answer you must cross out your original answer as shown. 

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown. 

0 1

1

Which of these system diagrams shows a correct sequence of events within the water cycle?

[1 mark]

- A** Precipitation, infiltration, interception, channel flow, flow into sea
- B** Precipitation, run off, channel flow, evaporation, uptake by vegetation
- C** Precipitation, run off, through flow, evaporation, cloud formation
- D** Precipitation, surface storage, infiltration, through flow, soil water storage

0 1

2

Which of the following groups consists of human activities that are all adding to the concentration of greenhouse gases in the atmosphere?

[1 mark]

- A** Building nuclear power stations, running solar power plants, fracking for shale gas, formula 1 motor racing
- B** Burning coal in power stations, using diesel fuel in cars, intensive rearing of cattle, felling and burning rain forest
- C** Flying long-haul aircraft, sustainable forestry, building pipelines across permafrost, destroying coral reefs
- D** Intensive rice growing, line fishing for tuna, off shore wind power, poor insulation of buildings

0 1

3

Which of the following shows the four major layers of the planet that contain the majority of Earth's water in solid, liquid or gaseous form?

[1 mark]

- A** Atmosphere, bathysphere, cryosphere, ionosphere
- B** Hydrosphere, cryosphere, exosphere, troposphere
- C** Ionosphere, exosphere, troposphere, bathysphere
- D** Lithosphere, atmosphere, hydrosphere, cryosphere

0 1

4

Which of the following are all ways of transferring carbon within the carbon cycle?

[1 mark]

- A** Combustion, infiltration, distribution, carbon capture
- B** Photosynthesis, combustion, respiration, decomposition
- C** Respiration, decomposition, discrimination, transpiration
- D** Sequestration, precipitation, carbon capture and storage, photosynthesis

0 1

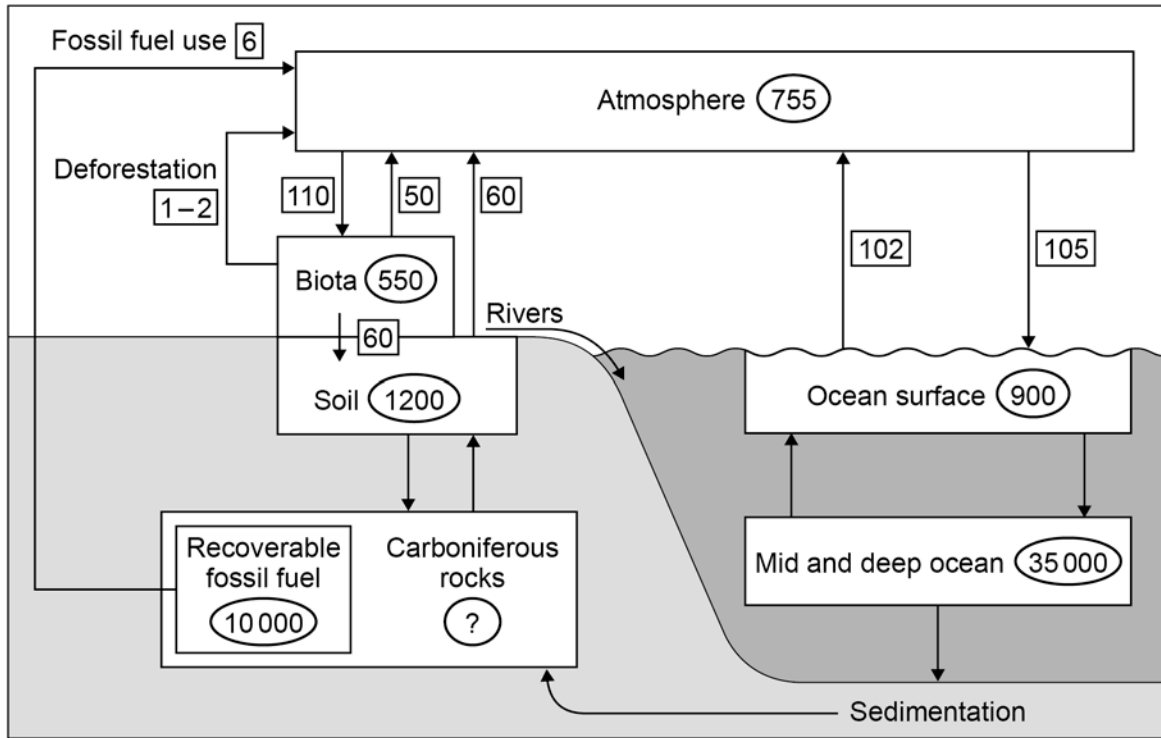
5

A system is in a state of dynamic equilibrium when:

[1 mark]

- A** All the feedback loops are producing positive changes to improve the system
- B** It has developed to the point where nothing happens
- C** It is in a state of constant and unpredictable change
- D** The system is still changing but it constantly adjusts and appears to be in balance

Figure 1



Global carbon cycle showing major stores and flows, the values shown are in billion Tons of carbon.

Study **Figure 1**, which shows transfers of carbon between the atmosphere and the Earth and oceans.

0 2

Analyse the total flows between the atmosphere and the Earth and oceans in a year and calculate the net effect on atmospheric carbon.

[6 marks]

Turn over for the next question

Figure 2



The 2010 flood—which affected all the provinces and regions of Pakistan—killed 1,600 people, caused damage totalling over \$10 billion, and inundated an area of about 38,600 km². This flood was Pakistan's most damaging on record. Sindh Province, the most downstream section of the Indus Basin, suffered the highest damage (43% of the total).

High evaporation over the Indian Ocean caused severe monsoon weather in 2010. A 24-hour rainfall on 29 July 2010, for instance, ranged from 21 mm to 280 mm at 18 stations in the Indus Basin, with an average of 128 mm. The next day, a 24-hour rainfall of 240 mm was recorded in the city of Kamra, Punjab, and 189 mm in Ghari Dopatta, Northeast Pakistan. The average rainfall for the 18 Indus Basin stations was estimated at 290 mm in July and 189 mm in August, almost double the historical levels. For the same month's river flow at some of the flood control schemes in the basin was at record levels: it severely damaged some schemes and washed away others altogether.

Section B – Ecosystems Under Stress

Answer **all** questions in the spaces provided

Only **one** answer per question is allowed.


For each answer completely fill in the circle alongside the appropriate answer.


CORRECT METHOD



WRONG METHODS



If you want to change your answer you must cross out your original answer as shown. 

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown. 

0 5 · **1** In an ecosystem a primary producer is:

[1 mark]

- A** A single-cell organism that is the simplest part of the food chain
- B** An organism that uses photosynthesis to capture energy from the sun
- C** The most common species in that ecosystem
- D** The organism at the top of the food chain that consumes other carnivores

0 5 · **2** A seral progression is:

[1 mark]

- A** A classification of plants, going from simple organisms to more complex ones
- B** The stages that a plant community goes through before reaching its climatic climax
- C** The work done by scientists to improve the yield or disease resistance of rice or wheat
- D** When an interrupting factor stops an ecosystem reaching its plagio-climax

0 5

3

Which of the following groups are all biomes?

[1 mark]

- A** Bare rock, psammosere, plagio-climax vegetation, halosere
- B** Desert, forest, prairie grassland, ice sheet
- C** Mediterranean vegetation, taiga (or coniferous forest), temperate deciduous forest, tundra
- D** Sand dunes, salt marshes, semi desert scrub, coral reefs

0 5

4

The savanna grassland biome is found in areas with:

[1 mark]

- A** average monthly temperatures over 25 degrees C for at least 9 months every year
- B** hot dry summers and warm wet winters
- C** mainly hot and dry with occasional, unpredictable, torrential rain
- D** wet summer seasons when the sun is overhead, followed by a dry season

0 5

5

The rainforest biome is characterised by:

[1 mark]

- A** A canopy of trees, cutting out the light and stopping any plant growth beneath the canopy
- B** A large variety of plant species, which can form several distinct layers in the forest
- C** Deep, fertile soils because of decayed leaves being carried to great depth in the soil
- D** Huge areas covered with just one species of tree, which is perfectly adapted to the temperature and moisture

Figure 3a and **Figure 3b** both show data for the Great Barrier Reef, Australia.

Figure 3a shows sea surface temperatures recorded between 1900 and 2016.

Figure 3b shows annual mortality (death) of coral between 1985 and 2011 alongside the recorded cause.

Figure 3a

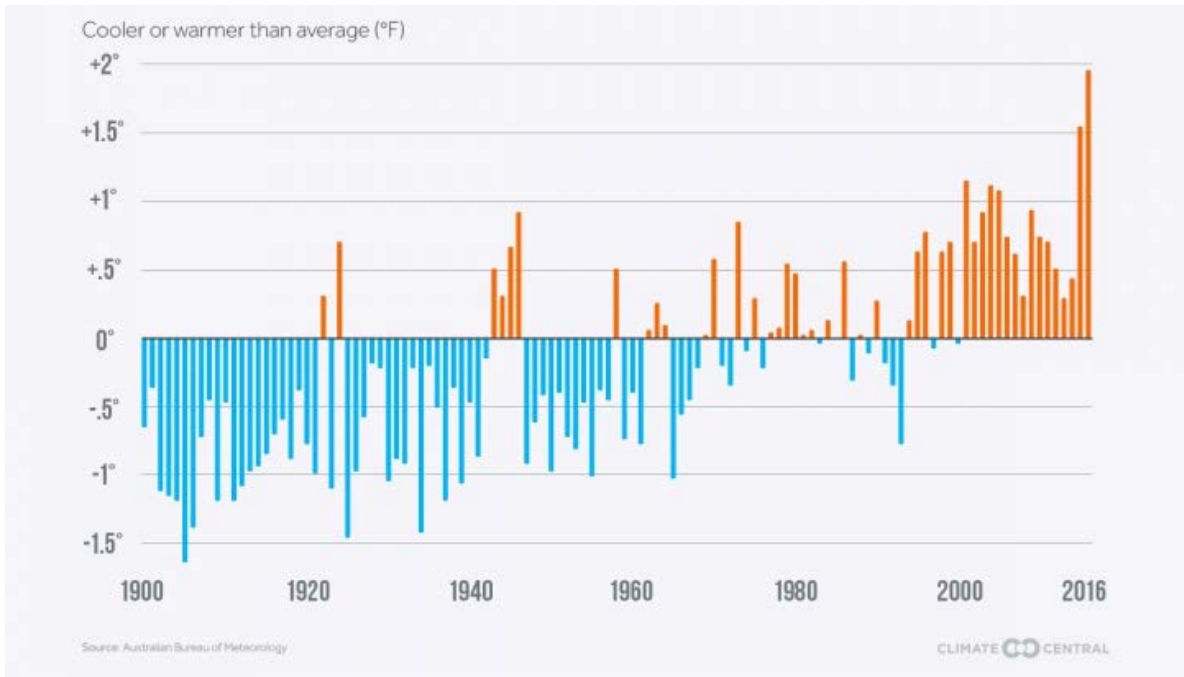
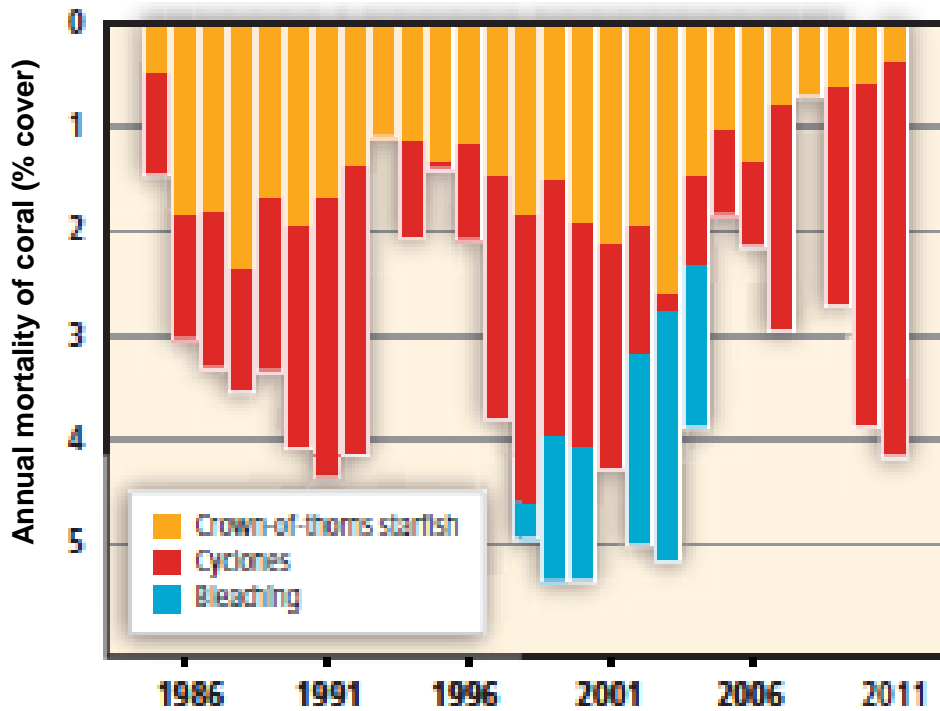


Figure 3b



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Figure 3a: Figure CR-1 (e) from Gattuso, J.-P., O. Hoegh-Guldberg, and H.-O. Portner, 2014: Cross-chapter box on coral reefs. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Figure 3b: source: Climate Central

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