ADDITIONAL MATERIALS

In addition to this examination paper, you will need one 12 page answer book and a calculator.

INSTRUCTIONS TO CANDIDATES

Answer in Section A, either 1, 2 and, either 3 or 4 (Coastal Landscapes) or 5, 6 and either 7 or 8 (Glaciated Landscapes).

Answer 9, 10 and, either 11 or 12 in Section B (Changing Places).

Use either black ink or black ball-point pen.

Write your answers in the separate answer book provided.

Write your name, centre number and candidate number in the spaces at the top of the answer book.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part-question; you are advised to divide your time accordingly.

This paper requires that you make as full use as possible of appropriate examples and reference to data to support your answers. Sketch maps and diagrams should be included where relevant.
Section A – Changing Landscapes

Answer **either** question 1, 2 and, either **3 or 4** or questions 5, 6 and, either **7 or 8** from your chosen landscape.

Where possible, make full use of examples and data to support your answers.

**Coastal Landscapes**

Answer questions 1, 2 and, either **3 or 4** if this is your chosen landscape.

**Figure 1: Shoreline management in North Norfolk, England**

![Shoreline management in North Norfolk, England](image)

Source: adapted from Ordnance Survey and maps environment-agency
1. (a) (i) Use Figure 1 to outline how the choice of the shoreline management strategies shown in boxes A and B suggests that the principles of cost-benefit have been used. [5]

(ii) With reference to Figure 1, suggest why there is likely to be an increasing need for shoreline management. [6]

(b) State what is meant by the term isostatic change. [2]
Figure 2: Contrasting coastline dynamics of the southern Baltic Sea, 1995 and 2005

Figure 2a: Coastline for Klaipeda

Map locating Klaipeda and Kaliningrad

Figure 2b: Coastline for Kaliningrad

Source: adapted from corpi.ku
2. (a) (i) Use Figure 2 to examine to what extent the coastal dynamics of Klaipeda and Kaliningrad differ. [5]

(ii) Suggest one reason why rates of coastal erosion vary. [2]

(b) Describe two ways in which coastal sediment is transported. [6]

Either:

3. Evaluate the importance of sediment transport in the development of one coastal depositional landform. [15]

Within your answer to question 3, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

Or:

4. To what extent has a fall in sea level modified coastal landscapes? [15]

Within your answer to question 4, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.
Glaciated Landscapes

Answer questions 5, 6 and, either 7 or 8 if this is your chosen landscape.

Figure 3: Polar Ice Mass Balance 1992 – 2010

Greenland and Antarctic Ice Sheets – 1992 is the base line, subsequent values show seasonal and longer term relative +/- values.

Source: earthobservatory.nasa.gov

5. (a) (i) Use Figure 3 to assess variations in the rates of change in the polar ice mass. [5]

(ii) Explain why seasonal changes in the polar ice mass balance are the result of variations in inputs and outputs. [6]

(b) Distinguish between warm-based and cold-based glaciers. [2]
Figure 4: Thulagi Glacier and Lake, Nepal, in 1992 and 2009

**Photograph and data for 1992**
- Length of Thulagi Lake is 1.85 km (*estimated*)
- Length of Thulagi Glacier is 5.10 km
- Ice core in terminal moraine is 5m below surface
- Surface area of lake is 0.81 sq. km

**Photograph and data for 2009**
- Length of Thulagi Lake is 2.55 km
- Length of Thulagi Glacier is 5.03 km
- Ice core in terminal moraine is 20+ m below surface
- Surface area of lake is 0.94 sq. km
- Thulagi lake is approximately 5.8m lower than in 1992

Source: adapted from icimod.org

6. (a) (i) Use **Figure 4** to compare changes to the landscape caused by climate change between 1992 and 2009. Include relevant data in your answer. [5]

(ii) Contrast the depositional location of terminal and medial moraines. [2]

(b) Outline **two** processes of glacial erosion. [6]
Either:

7. Evaluate the importance of geological factors in affecting rates of glacial erosion. [15]

Within your answer to question 7, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

Or:

8. Evaluate the importance of fluvial transport in the characteristics and formation of one fluvial landform. [15]

Within your answer to question 8, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.
Section B – Changing Places

Answer questions 9, 10 and, either 11 or 12.

Make the fullest possible use of examples to support your answers.

Figure 5: Relationship between the percentage of residents aged 16-64 with degree level or above qualifications and the percentage of high tech industry in the 12 regions of the UK

<table>
<thead>
<tr>
<th>UK Region</th>
<th>% of residents aged 16-64 with degree level or above</th>
<th>Rank</th>
<th>% high tech industry</th>
<th>Rank</th>
<th>Difference (d)</th>
<th>Difference squared (d^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East</td>
<td>32.3</td>
<td>2</td>
<td>9.8</td>
<td>1</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Eastern</td>
<td>28.1</td>
<td>4</td>
<td>8.3</td>
<td>3</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Scotland</td>
<td>26.0</td>
<td>7</td>
<td>8.6</td>
<td>2</td>
<td>-5</td>
<td>25</td>
</tr>
<tr>
<td>London</td>
<td>40.5</td>
<td>1</td>
<td>7.3</td>
<td>7</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>South West</td>
<td>29.5</td>
<td>3</td>
<td>7.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North West</td>
<td>26.6</td>
<td>5</td>
<td>7.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Midlands</td>
<td>25.8</td>
<td>8</td>
<td>7.5</td>
<td>6</td>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>West Midlands</td>
<td>25.5</td>
<td>9</td>
<td>6.8</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North East</td>
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<td>11</td>
<td>7.0</td>
<td>8</td>
<td>-3</td>
<td>9</td>
</tr>
<tr>
<td>Wales</td>
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<td>6</td>
<td>6.5</td>
<td>10</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Yorkshire &amp; Humberside</td>
<td>25.4</td>
<td>10</td>
<td>6.1</td>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>23.6</td>
<td>12</td>
<td>5.1</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>∑ d^2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95.5</td>
</tr>
</tbody>
</table>

Source: Adapted from ONS 2011 census data

9. (a) (i) Define the term *quaternary industry*. [2]

(ii) Study Figure 5. Calculate the missing figures for the South West and the North West. [2]

(iii) The Spearman Rank Correlation Co-efficient ($r_s$) was calculated as $r_s = 0.67$. Using the values of $r_s$ in the table below, state the statistical significance of the result and explain your decision. [3]

<table>
<thead>
<tr>
<th>Significance (confidence level)</th>
<th>95%</th>
<th>99%</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=10</td>
<td>0.56</td>
<td>0.75</td>
</tr>
<tr>
<td>n=12</td>
<td>0.50</td>
<td>0.71</td>
</tr>
</tbody>
</table>

(b) Describe how the process of gentrification leads to changes in the characteristics of places. [6]
Figure 6: Tourism information for a Scottish island, 2005-2015

Comments in the visitor book at the island tourist centre

‘My family come over here for a daytrip every year; it’s a brilliant place to visit. Beautiful scenery. Great restaurants.’

‘We tried staying here for a week for the first time this year but I don’t know if we’ll be back. It’s overpriced and it rained a lot. Sorry.’

Comments in letters sent to the local newspaper

‘This island was a whole lot better when there were no tourists on the road driving at 5 miles an hour and holding up traffic.’

‘We need proper jobs with skills and good money to keep the young people here, not part-time jobs cleaning hotel rooms and waiting tables.’

10. (a) Use the information in Figure 6 to assess the success of tourism in this location. [5]

(b) Suggest how the trends shown in Figure 6 can affect local rural communities. [8]

Either:

11. Evaluate why some people have benefited more than others from recent changes in the central areas of cities. [15]

Within your answer to question 11, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

Or:

12. Assess how far different aspects of the rural rebranding process may rely on internet availability. [15]

Within your answer to question 12, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.