Q1.

Which of the following describes the concept of liveability?

[1 mark]

A	The changes experienced in western cities in the late twentieth century.	⬭
B	The demands made on global natural resources by individuals or groups of people.	⬭
C	The existing urban population lives without compromising the ability of future populations to live with the same quality of life.	⬭
D	The quality of life is enhanced for people by good access to services which meet their needs.	⬭

Q2.

To what extent do you agree that urban drainage presents more opportunities than challenges in developing more sustainable cities?

[20 marks]

Q3.

'Environmental issues in urban areas will always emerge despite attempts to be more sustainable.'

With reference to **two** contrasting urban areas that you have studied, to what extent do you agree with this statement?

[20 marks]

Q4.

Evaluate the relative importance of strategies used to develop sustainable cities in overcoming environmental problems for **one** urban area you have studied.

[9 marks]

_____

_____

_____

_____

Q5.

"The environmental sustainability of urban areas is influenced by the physical environmental conditions of each place."

With reference to two contrasting places, to what extent do you agree with this view?

[20 marks]

Q1.

D

AO1 = 1
[Total 1 mark]

Q2.

AO1 – Knowledge and understanding of urban drainage – urban precipitation, storage and catchment characteristics, urban water cycle, movement of water through urban areas. Knowledge and understanding of the challenges and opportunities in developing more sustainable cities.

AO2 – Application of knowledge and understanding to analyse and evaluate the extent to which urban drainage presents challenges to sustainable cities. Application of knowledge and understanding to analyse and evaluate the extent to which urban drainage presents opportunities to develop more sustainable cities.

Notes for answers

The question links various aspects of the Contemporary urban environments section of the specification, specifically urban drainage and the challenges and opportunities for developing more sustainable cities. There is no requirement to include specific examples and detail could be included through concepts such as urban catchments as well as place -specific examples.

AO1

- Knowledge and understanding of urban drainage and how it is different from drainage in rural areas.
- Knowledge and understanding of urban precipitation and water movement through the catchment. Higher proportion of precipitation reaching urban river channels and the reduced lag time. The subsequent increase in flood risk. Lack of seasonal variations. Decrease in the base or normal flow of the river.
- Knowledge of storm hydrographs for urban areas.
- Knowledge and understanding of the urban water cycle, for example interruption to the water cycle in urban areas through human activities such as uses in industry.
- Impacts on catchment management – flood management, water pollution, sediment accretion from erosion.
- Knowledge and understanding on the challenges and opportunities for developing sustainable cities. They may consider economic, social and environmental challenges / opportunities in developing sustainable cities.
- Case-study knowledge of the challenges and opportunities in developing sustainable cities for example Copenhagen, Curitiba or Freiburg.

AO2

- Assessment of the link between urban drainage and sustainability on an economic, social or environmental level.
- Evaluation of the link between urban drainage and the challenges in developing sustainable cities, for example increased flood risk, diverts money from sustainable strategies and frequently means that large-scale flood management schemes have to be employed that significantly impact on environmental sustainability. The impact of flood risk on the concept of liveability.
- Evaluation of the impact of urban catchment and storage on sustainability. Construction of channelised rivers reduces the flood risk but also has a significant

impact on natural habitats. For example, the Los Angeles River is almost entirely concreted with very few natural areas.

- The extent to which past urban processes such as industrialisation have impacted on urban drainage may be considered and the resulting challenges. For example, the Sheffield and Tinsley canal fell into disuse following construction of the railway and then even more so following deindustrialisation. This resulted in water contamination and is a challenge to sustainability.
- The extent to which issues associated with urban drainage can be managed through strategies to such as SuDS. For example the lag time can be increased by construction of green roofs and the creation of detention basins.
- Evaluation of schemes such as SuDs in creating opportunities for sustainable urban areas. For example, at Lamb Drove biodiversity and ecology has increased as a result of SuDS and this has also reduced flood risk improving quality of life and social sustainability.
- Evaluation of how attempts to improve urban drainage through schemes such as river restoration might create opportunities for sustainability. For example, the River Don in Sheffield has been restored creating the Blue Loop, this has rejuvenated the area for cyclists and runners increasing liveability and it has also encouraged biodiversity by restoring natural ecosystems. Thereby providing opportunities for both social and environmental sustainability.
- Some students may assess the role of sustainable cities in managing urban drainage. This would be a legitimate response as long as it is linked to the question ie that actually it is the need for sustainable strategies that is impacting on urban drainage. For example Freiburg's sustainability drive has resulted in much of the River Dreisam being unmanaged and subsequent water movement is more natural. Rainwater harvesting is widely employed to protect ground water storage supplies in the city.
- They may also consider alternative futures. Increased precipitation and storm events may make managing urban drainage increasingly challenging. This will have significant impacts on developing more sustainable cities. However, pressure from urban dwellers demanding sustainable strategies may increase the spending on flood risk and recreational areas so improving management of urban drainage.
- An overall judgement of the extent to which urban drainage provides more opportunities than challenges should be addressed. Any conclusion is valid as long as it is supported by the evidence in the response.

Credit any other valid approach.

Level 4 (16–20 marks)

- Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).
- Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).
- Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).
- Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).
- Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

Level 3 (11–15 marks)

- Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).
- Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

- Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).
- Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).
- Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

Level 2 (6–10 marks)
- Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).
- Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).
- Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).
- Some knowledge and understanding of key concepts, processes and interactions and change (AO1).
- Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

Level 1 (1–5 marks)
- Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2).
- Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).
- Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Very limited relevant knowledge and understanding of place(s) and environments (AO1).
- Isolated knowledge and understanding of key concepts and processes (AO1).
- Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

Level 0 (0 marks)
- Nothing worthy of credit.

AO1 = 10, AO2 = 10

[Total 20 marks]

Q3.

AO1 − Knowledge and understanding of the nature of a range of impacts urban areas have on both local and global environments. Knowledge and understanding of case studies of two contrasting urban areas.

AO2 − Application of knowledge and understanding to assess the negative extent of environmental impacts of urban areas in two contrasting urban areas. Assessment should come to a view about the extent to which the environmental impacts of urban areas are negative.

Notes for answers

AO1
- Environmental impact of urban areas in two contrasting urban areas. Ecological

footprint of urban areas. Dimensions of sustainability: natural, physical, social and economic. Nature and features of sustainable cities. Concept of liveability.
- Environmental problems in contrasting urban areas: atmospheric pollution, water pollution and dereliction.
- Case studies of contrasting urban areas to illustrate and analyse the nature and impact of physical environmental conditions. With particular reference to the implications for environmental sustainability, the character of the urban areas and the experience and attitudes of their populations.
- The impact of urban forms and processes on local climate and weather.
- Urban temperatures: the urban heat island effect. Precipitation: frequency and intensity. Fogs and thunderstorms in urban environments. Wind: the effects of urban structures and layout on wind speed, direction and frequency. Air quality: particulate and photo-chemical pollution.
- Urban precipitation, surfaces and catchment characteristics; impacts on drainage basin storage areas; urban water cycle: water movement through urban catchments.
- The environmental impacts of alternative approaches to waste disposal: unregulated, recycling, recovery, incineration, burial, submergence and trade.

AO2
- Assessment − Expect to see a wide range of approaches to this question however as the focus of the question originates from the 'sustainable urban development' element of the specification, responses will probably assess sustainability in the contrasting urban areas as the focus of their assessment.
- Assessment − Responses should seek to address the extent to which the contrasting urban areas have negative environmental impacts. Impacts may originate from factors such as: transport, energy production / consumption, construction, waste management, urban form, water management, food production / consumption.
- Assessment − Responses should seek to address the nature of the environmental impacts. Impacts are likely to focus on air, water and land, which are all valid.
- Assessment − Responses should seek to address how environmental impacts differ between the urban areas.
- Assessment − Expect clear case study detail in support. The level of detail and assessment of extent to which environmental impacts are negative in the contrasting urban areas will be important in differentiating candidates.
- Assessment − there should be some explicit element which considers the question. For example, some may conclude that the environmental impacts of both urban areas are negative and the areas are not sustainable as urban living automatically has some negative environmental impacts. However, the question seeks to ellicit assessment of which urban area has the most negative environmental impacts. Some may argue that the larger and most rapidly urbanising of the two areas has the greatest negative environmental impacts.
- Any overall conclusion is legitimate as long as there is clear rationale based upon preceding content.

Level 4 (16−20 marks)
- Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).
- Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).
- Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).
- Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).
- Detailed awareness of scale and temporal change which is well-integrated where

appropriate (AO1).

Level 3 (11−15 marks)
- Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).
- Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).
- Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).
- Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).
- Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

Level 2 (6−10 marks)
- Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).
- Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).
- Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).
- Some knowledge and understanding of key concepts, processes and interactions and change (AO1).
- Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

Level 1 (1−5 marks)
- Very limited and / or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2).
- Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).
- Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Very limited relevant knowledge and understanding of place(s) and environments (AO1).
- Isolated knowledge and understanding of key concepts and processes.
- Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

Level 0 (0 marks)
- Nothing worthy of credit.

AO1 = 10, AO2 = 10

[Total 20 marks]

Q4.

AO1 − Knowledge and understanding of strategies used to develop sustainable cities and knowledge and understanding of the environmental challenges found in one urban area studied.

AO2 − Application of knowledge and understanding to analyse and evaluate the extent to which strategies to develop sustainable cities could be utilised in an urban area studied.

Mark scheme

Level 3 (7−9 marks)
AO1 − Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout.
AO2 − Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation is detailed and well supported with appropriate evidence. A well balanced and coherent argument is presented.

Level 2 (4−6 marks)
AO1 − Demonstrates some appropriate knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy.
AO2 − Applies some knowledge and understanding appropriately. Connections and relationships between different aspects of study are emerging / evident with some relevance. Analysis and evaluation evident and supported with some appropriate evidence. A clear but partial argument is presented.

Level 1 (1−3 marks)
AO1 − Demonstrates basic/limited knowledge and understanding of concepts, processes, interactions and change. These offer limited relevance with inaccuracy.
AO2 − Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation basic and supported with limited appropriate evidence. A basic argument is presented.

Notes for answers

The question links two aspects of the contemporary urban environments section of the specification, namely sustainable urban development and the case-studies of urban areas. Students can also draw on the key idea of environmental problems in urban settings.

AO1

- Knowledge of strategies used to develop sustainable cities. Examples could include transport, recycling, affordable housing, renewable energy, sustainable urban drainage.
- Understanding of the concept of sustainable cities. Meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- Knowledge and understanding of environmental challenges in urban areas. These might include waste disposal, lack of green space, traffic congestion, air pollution and water pollution.
- Case-study of an urban area. Knowledge of the physical environment and the role played in environmental issues. Understanding of the environmental challenges found in the urban area.
- The character of the study area − experiences and attitudes of population.

AO2

- Evaluation of the extent to which sustainable strategies are successful. Recycling schemes very much dependant on willingness and education of resident population. Water harvesting and recycling used in BEDZED has been successful in reducing water consumption by 50%.
- Analysis of extent of usefulness of sustainable strategies in the study area. For example, bike rental schemes may not be applicable in all urban areas if there is not a large cycle network. The development of public transport could be applied to most urban areas.

- Evaluation of the success of sustainable strategies in the study area. For example, in Bangalore, rainwater harvesting employed in new housing developments. However, this is limited to housing provided for IT workers and not provided for the city's slums.
- Analysis of the effect of attitudes of the local population towards sustainable development. This is very much dependent on the case-study used. They may consider for example that in a LIC, the emphasis is more on improving economic and social well-being rather than environmental concerns. They may argue that sustainable development is a luxury that most residents / governments can't afford.
- Extent of success of strategies to develop sustainable urban living may depend on the environmental problems found in the study area. For example, overcoming waste issues may be easier to tackle in London compared to overcoming water shortages in Mexico City.
- Overall evaluation of the relative importance of sustainable strategies and their likely success in overcoming environmental challenges in the study area.

AO1 = 4, AO2 = 5

[Total 9 marks]

Q5.

AO1 − Knowledge and understanding of the factors affecting issues of environmental sustainability. Knowledge and understanding of the principles associated with understanding the character of the urban areas and nature and impact of physical environmental conditions on the environmental sustainability.

AO2 − Application of knowledge and understanding to assess a range of issues of environmental sustainability in contrasting urban areas and to judge how the nature of the physical environmental conditions of each area impact on that sustainability.

Notes for answers

AO1

- The nature and impact of physical environmental conditions with particular reference to the implications for environmental sustainability.
- Urban characteristics in contrasting settings. Physical environmental factors in urban forms − including the shape, size, density and make-up or configuration of settlements. Spatial patterns of land use.
- Impacts of urban forms on local climate and weather − urban micro-climates: the urban heat island, urban precipitation, wind and urban air quality.
- Urban drainage − Issues associated with catchment management in urban areas. The development of sustainable urban drainage systems. River restoration and conservation in damaged urban catchments.
- Environmental problems in contrasting urban areas: atmospheric pollution, water pollution and dereliction.
- Impact of urban areas on local environments. Environmental sustainability. Nature and features of sustainable cities. Concept of liveability.
- Contemporary opportunities and challenges in developing more sustainable cities.
- Strategies for developing more sustainable cities.
- Case studies of two contrasting urban areas illustrating the nature and impact of physical environmental conditions, with particular reference to the implications for environmental sustainability.

AO2

Responses are expected to show an understanding of the impact of the physical environmental conditions on issues of environmental sustainability in contrasting urban areas. There should be clear recognition of the learning from the case studies of two contrasting urban areas from the Contemporary urban environments unit, however reciting

learned case study material does not constitute AO2. It is the integration of the two aspects of the question that allows access to AO2.

- Responses will assess the nature of the physical urban environment of the named case studies − this will include an assessment of the physical characteristics that make up their urban form, including the shape, size, density and organisation.
- One issue of environmental sustainability that responses may assess is urban drainage in the contrasting urban areas. Assessment of environmental sustainability issues relating to different aspects of the urban water cycle, including: usage of water in urban areas; water distribution; water treatment; wastewater collection; wastewater treatment. Some will assess issues relating to environmental sustainability associated with river flood management strategies, and / or river restoration and conservation. This will offer opportunities to make comparisons of different river management strategies in the contrasting urban areas, with different decisions affecting the level of environmental sustainability. If issues associated with catchment management in urban areas are raised expect assessment of sustainable urban drainage systems (SUDS) and how attempting to manage drainage in a more natural way impacts on the level of environmental sustainability.
- Expect responses to assess issues of environmental sustainability relating to urban waste and its disposal in the contrasting urban environments. This would allow an assessment of different strategies to manage waste in urban areas, including: landfill sites; incineration; waste reduction; recycling − physical reprocessing, biological reprocessing, recycling of e-waste; water pollution − chemical, thermal, pathogen; dereliction. Assessment could focus on the different environmental sustainability issues raised by these, or on the sustainability issues associated with their management in different urban areas and the overall impact on the level of environmental sustainability.
- Other issues of environmental sustainability that responses could assess may include air quality and atmospheric pollution. Others may assess the impact of urbanisation on surrounding rural areas as cities in some parts of the world continue to expand, which could also include issues relating to impacts of increasing urban populations on other natural resources.

Overall evaluation − The judgements made about the nature of the issues of environmental sustainability will depend on the illustrative examples used as evidence. Ultimately assessment must focus on how any issues of environmental sustainability are affected by the physical environmental conditions and come to a view on the contrasting extent of these in the different urban settings.

Level 4 (16−20 marks)

- Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).
- Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).
- Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).
- Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).
- Detailed awareness of scale and temporal change which is well-integrated where appropriate (AO1).

Level 3 (11−15 marks)

- Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).
- Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

- Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).
- Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).
- Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

Level 2 (6−10 marks)
- Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).
- Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).
- Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).
- Some knowledge and understanding of key concepts, processes and interactions and change (AO1).
- Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

Level 1 (1−5 marks)
- Very limited and / or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2).
- Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).
- Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).
- Very limited relevant knowledge and understanding of place(s) and environments (AO1).
- Isolated knowledge and understanding of key concepts and processes (AO1).
- Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

Level 0 (0 marks)
- Nothing worthy of credit.

AO1 = 10, AO2 = 10

[Total 20 marks]

Q2.

There were some very good responses to this question. Some of the best responses assessed the opportunities brought about by river restoration projects such as the Cheonggyecheon in Seoul or specific SUDs and then compared this to the challenges of managing flood risk in cities, leading to unsustainable practices. Weaker responses were typified by a lack of specific examples and a reliance on generic knowledge of sustainable cities.

Q3.

Many candidates found this question quite challenging. Whilst 51% did reach Level 3 or higher, only 12% scored in Level 4 and 10% failed to get out of Level 1. Many were confident in their AO1 knowledge and understanding of the characteristics of their two case studies, but often failed to give clear assessment of specific environmental issues or specific attempts at sustainability in these locations. The best answers engaged with the assumption of inevitability suggested in the question. These applied their knowledge and understanding of their case studies to either argue for or against this inevitability. Many came to the view that urban areas are inevitably unsustainable and that they will always pose environmental issues. This approach was valid and could score well if the argument was clearly supported with evidence from their chosen urban areas. A limited number of responses self-penalised by only referring to one urban area. Any scale of urban area was accepted. Some focused on whole cities, e.g. Mumbai, whilst others focused on more local scaled examples, e.g. Dharavi in Mumbai. Either approach was valid. As long as there was some clear difference in some aspect of the chosen case studies, examiners were open to most contrasting places offered by candidates.

It is worth reminding centres that both 20-mark questions will not have direct links to the identified specification content. Students need to be prepared to use their knowledge and understanding of content, concepts and processes. This should then be applied to the context of questions, rather than a narrative approach of reciting learned materials which some more limited responses showed.

Q4.

This question was generally not well-answered. Very few students considered the relative importance of sustainable strategies in dealing with environmental problems. Too many students seemed to have not really moved beyond GCSE case studies such as of Curitiba or BedZED.
The best approaches discussed how sustainable strategies might be used to overcome environmental problems in an urban area they had studied. For example, some students discussed the difficulties of implementing a congestion charge in Mumbai and concluded that perhaps strategies used to recycle waste are more important and useful.