



**JURONG JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION 2018**

GEOGRAPHY

Higher 1

8813/01

Paper 1

29 August 2018

3 hours

READ THESE INSTRUCTIONS FIRST

Write your name and class on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use paper clips, highlighters, glue or correction fluid.

Answer 4 Questions in total.

Section A

Answer Question 1.

Section B

Answer Question 2.

Section C

Answer **two** questions, each from a different theme.

The Insert contains all the Resources referred to in the questions.
Diagrams and sketch maps should be drawn whenever they serve to illustrate an answer.
You are reminded of the need for good English and clear presentation in your answers.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [] at the end of each question or part question.

Please attach your answers to the cover page provided.

This document consists of 4 printed pages.

[Turn over

Section A**Theme 3: Geographical Investigation**

1

A group of 24, eighteen year old students from Jurong Junior College in Singapore wanted to study the needs of the elderly living in the various public housing estates in Singapore. They had access to various census and survey information on the needs of the elderly from government sources.

The students also wanted to investigate the elderly residents' satisfaction in relation to the various amenities in the neighbourhood. They wanted to investigate the various areas that could enhance the urban liveability of the neighbourhood for elderly residents. They were allocated three days for field investigations at the end of November in the mornings.

Resource 1 shows data on satisfaction levels with elderly-friendly facilities.
Resource 2 shows data on the resident's awareness of Eldercare Services.

- (a) With reference to Resources 1 and 2, explain if the needs of the elderly have been met. [4]
- (b) Explain how the students could have conducted an investigation to gather the data presented in Resource 1 and 2. [7]
- (c) Assess the usefulness and limitations of the data collection and representation methods used in Resource 2. [6]
- (d) Using Resource 1, explain the strengths and limitations of the data collection technique of using surveys to measure urban liveability. [5]
- (e) Suggest and justify another form of data representation method to showcase the information in Resource 1. [3]

Section B**Theme 1: Climate Change and Flooding**

2

Resource 3 shows the Percentage of CO₂ emissions by country.

Resource 4 shows the proportion of CO₂ emissions by sector and the type of fuel used in electricity generation.

Resource 5 shows the top climate change concerns by regions.

- (a) With reference to Resource 3, describe the distribution of CO₂ emissions by country. [5]
- (b) Using Resource 4 (with specific reference to electricity generated by fuel type) and your own knowledge, account for the CO₂ emissions of the United States. [6]
- (c) Using Resource 5, compare and account for the top climate concerns between Europe, Africa and Asia/Pacific. [6]
- (d) Using Resources 3, 5 and your own knowledge, discuss how top climatic concerns in Europe, Africa and Asia/Pacific could be addressed. [8]

[Turn over

Section C

Answer **two** questions from this section.

Either Question 3 **or** Question 4 and **Either** Question 5 **or** Question 6.

Theme 1: Climate Change and Flooding**3**

- (a) Account for the variation of precipitation in the tropics. [9]
- (b) Discuss the effects of climate change on human activity. [16]

4

- (a) Explain the different factors that affect the shape of storm hydrographs. [9]
- (b) "The causes of floods are mainly attributed to human rather than natural causes". Discuss the validity of this statement. [16]

Theme 2: Urban Change**5**

- (a) Explain factors that could affect sustainable development in cities of countries at different levels of economic development. [9]
- (b) Evaluate the effectiveness of waste management strategies used in countries of different levels of economic development. [16]

6

- (a) Explain the reasons to account for urban re-imaging in countries at high levels of development. [9]
- (b) To what extent have urban re-imaging strategies benefited everyone living in the cities of countries at high levels of development? [16]



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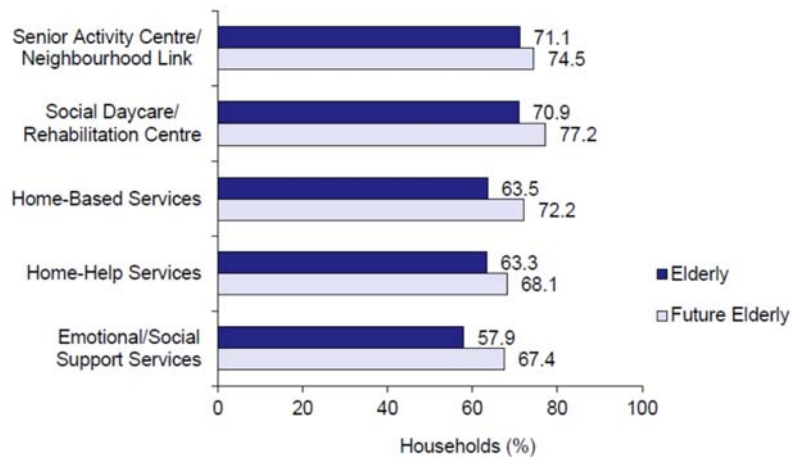
This document consists of **4** printed pages.

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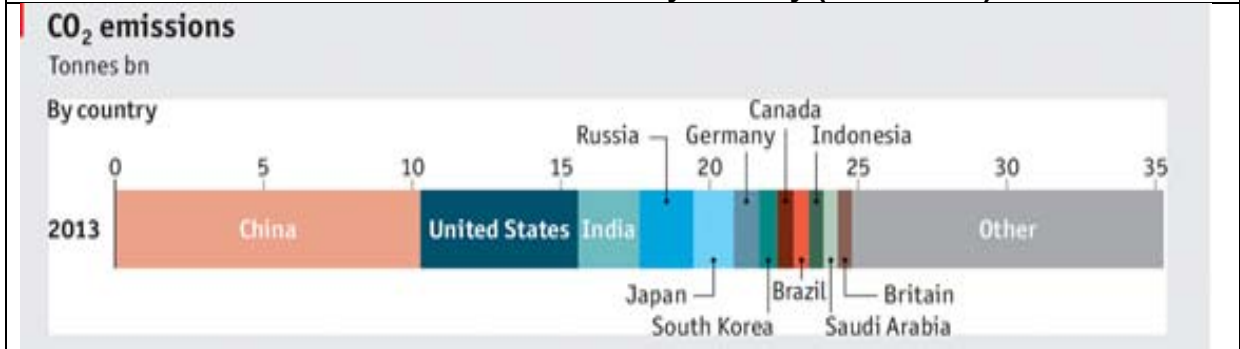
Resource 1 for Question 1
Satisfaction with Elderly-Friendly Facilities by Year

Facilities for Elderly	Households Satisfied (%)			
	2008		2013	
	Elderly	Future Elderly	Elderly	Future Elderly
Bird singing corner	98.6	97.5	94.4	89.0
Support handbars in lifts/along corridor	98.2	97.4	97.9	96.7
Pebble walk	97.7	97.1	96.4	95.9
Fitness station for elderly	97.0	96.4	96.2	94.8
Ramp	96.9	97.7	97.2	97.5
Lift landing on every level	96.5	96.0	95.5	94.4
Senior citizens' corner/centre	95.3	94.9	97.7	96.0
Benches/Seats/Tables	93.4	91.2	91.0	86.4

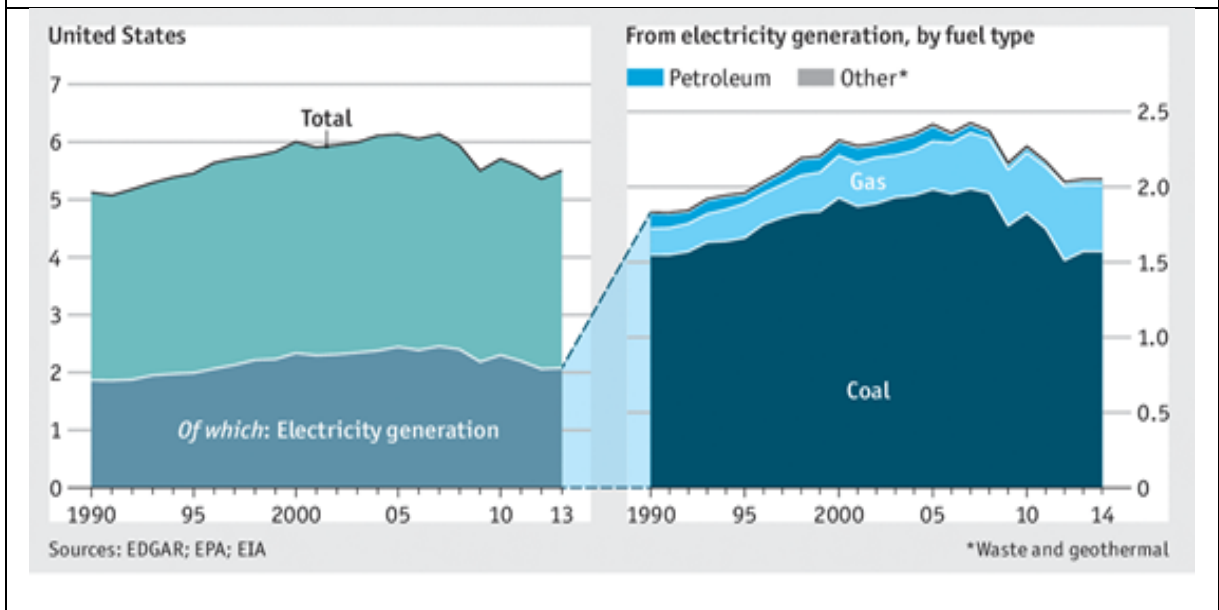
Resource 2 for Question 1
Awareness of Eldercare Services



Resource 3 for Question 2
Carbon dioxide emissions by country (Tonnes bn)



Resource 4 for Question 2
CO₂ emissions by sector and the type of fuel used in electricity generation



Resource 5 for Question 2
Top climate change concerns by regions

TOP CLIMATE CHANGE CONCERNS BY REGION

	Droughts or water shortages	Severe weather, like floods or intense storms	Long periods of unusually hot weather	Rising Sea Levels
LATIN AMERICA	59%	21%	12%	5%
AFRICA	59%	18%	16%	3%
U.S.	50%	16%	11%	17%
ASIA/ PACIFIC	41%	34%	13%	6%
MIDDLE EAST	38%	24%	19%	5%
EUROPE	35%	27%	8%	15%
GLOBAL	44%	25%	14%	6%

Note: Russia and Ukraine not included in Europe median.
Source: Spring 2015 Global Attitudes Survey, Q32
Data: Pew Research Center, November 2015,
"Global Concern about Climate Change, Broad Support for Limiting Emissions"

H1 Answer Key

DRQ

Question 1

(a)	With reference to Resources 1 and 2, explain if the needs of the elderly have been met.	[4]
	<p>Resource 1 is looking at the satisfaction level of the facilities of the Elderly and Resource 2 is looking at the awareness of eldercare services. In terms of overall, household satisfaction level in Resource 1, from 2008-2013, the elderly have a high level of satisfaction of the lowest score of 91% in all categories. This would indicate that their needs have been met. [1] However, there seems to be a fall in satisfaction level in all categories in terms of “Lift Landing on every level” and “Benches/Seats/Tables”, suggesting that needs are not entirely met. [1]</p> <p>For Resource 2, awareness of eldercare services is not a good indicator to indicate if needs are met as it doesn’t show the actual usage of these services. [1] However, the lack of awareness levels of the lowest 57.9% to highest 71.1%, suggest that there is a gap in provision of such services to the elderly, either they are not utilising it fully or unaware that they can use it. Or these are not a need at all for the elderly. [1]</p>	
(b)	Explain how the students could have conducted an investigation to gather the data presented in Resource 1 and 2.	[7]
	<ul style="list-style-type: none">• Define the age group of elderly & future elderly• Data collected from equal number of respondents in both categories <ol style="list-style-type: none">1. <u>Groups and venues</u> Students could organise themselves into 4 teams of 6 students each, each team will be assigned to a specific venue where the elderly/future elderly would most likely be. Students might want to work in pairs for safety.2. <u>Sample Size:</u> The students should conduct the surveys with the residents each student should at least do 10 surveys with random residents. This is to ensure that the sample size of the survey would be sufficient for data analysis.3. <u>Timing of the survey:</u> The survey should be done over 3 days at the end of November (are they weekdays or weekends? this might affect the number of survey respondents available). Students should ideally consider the timings that would allow them to have enough respondents to complete their surveys. Given the short 3 day period, students need to choose wisely their timings (e.g. weekday or weekend) to collect sufficient data. For instance maybe, 3 shifts per day at select timings (peak or non-peak	

	<p>hours), where there are more human traffic to be able to have sufficient respondents.</p> <p>4. <u>Survey questions</u> Students should design a short survey with a few questions asking respondents about their interaction levels. The survey should be short in MCQ or short answer questions, so that respondents would be willingly to participate, as it doesn't take up too much of their time.</p>					
(c)	Assess the usefulness and limitations of the data representation method used in Resource 2.	[6]				
	<p><u>Usefulness:</u></p> <ul style="list-style-type: none"> • Bar graphs are visually easy to understand, indicating the % clearly. • It also shows 2 categories of elderly and future elderly able to compare future generations. • Shows clearly the percentages accordingly. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • We do not know the sample size of participants for the survey. • Age group of elderly and future elderly is not clearly defined. 					
(d)	Explain the strength and limitations of the data collection technique of using surveys to measure urban liveability.	[5]				
	<ul style="list-style-type: none"> • Urban Liveability is a very broad topic that could be highly subjective as it looks into a various dimensions from physical facilities and beyond. There are also limitations to the data collection method. • Minimum one category from strength or limitations. <p><u>Questionnaire surveys</u></p> <table border="1"> <thead> <tr> <th>Strengths</th> <th>Limitations</th> </tr> </thead> <tbody> <tr> <td> <ol style="list-style-type: none"> 1. Large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way 2. Can be carried out by the researcher or by any number of people with limited affect to its validity and reliability 3. The results of the questionnaires can usually be quickly and easily quantified by either a researcher or through the use of a software package </td> <td> <ol style="list-style-type: none"> 1. Is argued to be inadequate to understand some forms of information - i.e. changes of emotions, behaviour, feelings etc. 2. Quantitative research is an artificial creation by the researcher, as it is asking only a limited amount of information without explanation. 3. There is no way to tell how truthful a respondent is being 4. People may read differently into each question and therefore reply based on their own interpretation of the </td> </tr> </tbody> </table>	Strengths	Limitations	<ol style="list-style-type: none"> 1. Large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way 2. Can be carried out by the researcher or by any number of people with limited affect to its validity and reliability 3. The results of the questionnaires can usually be quickly and easily quantified by either a researcher or through the use of a software package 	<ol style="list-style-type: none"> 1. Is argued to be inadequate to understand some forms of information - i.e. changes of emotions, behaviour, feelings etc. 2. Quantitative research is an artificial creation by the researcher, as it is asking only a limited amount of information without explanation. 3. There is no way to tell how truthful a respondent is being 4. People may read differently into each question and therefore reply based on their own interpretation of the 	
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	<p>4. Can be analysed more 'scientifically' and objectively than other forms of research</p> <p>5. When data has been quantified, it can be used to compare and contrast other research and may be used to measure change</p>	<p>question - i.e. what is 'good' to someone may be 'poor' to someone else, therefore there is a level of subjectivity that is not acknowledged</p> <p>5. There is a level of researcher imposition, meaning that when developing the questionnaire, the researcher is making their own decisions and assumptions as to what is and is not important...therefore they may be missing something that is of importance. [Research Biasedness]</p>	
(e)	Suggest and justify another form of data representation method to showcase the information in Resource 1.	[3]	
	<p><u>Piechart</u> Advantages</p> <ul style="list-style-type: none"> • display relative proportions of multiple classes of data • size of the circle can be made proportional to the total quantity it represents • summarize a large data set in visual form • be visually simpler than other types of graphs • permit a visual check of the reasonableness or accuracy of calculations • require minimal additional explanation • be easily understood due to widespread use in business and the media <p><u>Bar-graph</u> Advantages</p> <ul style="list-style-type: none"> • show each data category in a frequency distribution • display relative numbers or proportions of multiple categories • summarize a large data set in visual form • clarify trends better than do tables • estimate key values at a glance • permit a visual check of the accuracy and reasonableness of calculations • be easily understood due to widespread use in business and the media 		

Question 2

With reference to Resource 1, describe the distribution of CO₂ emissions by country. [5]

Highest: China at around 11 billion tonnes, United States at 5.5 billion tonnes, India and Russia at 2 billion tonnes, Japan at 1.5 billion tonnes, Germany 1 billion tonnes, S. Korea, Canada, Brazil, Indonesia, Saudi Arabia, Britain about 0.75 billion tonnes.

- a) Using Resource 2 (with specific reference to electricity generated by fuel type) and your own knowledge, account for the CO₂ emissions of the United States. [6]

US is the 2nd highest carbon emitter

- Reasons for high carbon emission can be attributed to high affluent population → High energy consumption and use such as cars and electricity
- Highly dependent on coal for electricity generation. Amongst all fossil fuels, coal has the highest carbon content → Output of carbon will be high
- Large population base of about 300 million → Thus total resource usage will be high

- b) Using Resource 3, compare and account for the top climate concerns between Europe, Africa and Asia/Pacific. [6]

Top climatic concerns were similar for droughts or water shortages & severe weather, like floods or intense storms. Ranges from 35% concern in Europe (Top concern) to 41% in Asia/Pacific and 59% in Africa (Top concern). Also for the 2nd most important concern, ranges from 27% in Europe to 18% in Africa and 34% in Asia/Pacific. In terms of the 3rd most important concern, Africa and Asia/Pacific registers long periods of unusually hot weather as the 3rd most concern ranging at 16% and 13% respectively. In Europe, the 3rd most concern is rising sea levels, at 15%. For the 4th most concern, Africa and Asia/Pacific registers rising sea levels ranging from 3% in Africa to 6% in Asia Pacific. For Europe, the 4th most important concern is long periods of unusually hot weather at 8%.

Reasons to account: All regions stated droughts or severe weather conditions as top 2 concerns as these concerns are generally more immediate given their increasing frequency of occurrence. Water shortages seem to be of more concern for Africa and Asia/Pacific given their large populations and vulnerability to droughts in certain regions. In Europe, though important, physical water scarcity may seem less of an issue as drought occurrences seem to be more rare in these regions than in Africa and Asia/Pacific. For Africa and Asia/Pacific, due to their large continent size that spans to lower latitudes, long periods of unusually hot weather takes the 3rd most important reason to them. For Europe, it may be of less concern because since they are located at higher latitudes, occurrences of such are less common than for Africa and Asia/Pacific.

- c) Using Resources 1,3 and your own knowledge, discuss how top climatic concerns in Europe, Africa and Asia/Pacific could be addressed. [8]

Indicative content:

Droughts, water shortages → Planning for water supplies such as reduced usage, more water efficiency, water desalination and water transfers. For Africa and Asia/Pacific, assistance could be provided for by more developed countries in the form of technology transfer and also of loans.

Intense storms/Floods → Dams, flood resistant features, flood management and prediction

Hot weather → Building design allowing for maximum ventilation, Green buildings and roofs to allow for cooling, energy efficiency appliances such as air conditioners

Rising sea levels → Sea walls, Raising land levels, pumping stations to allow low elevation areas to stay dry, improve drainage systems.

** Students will have to address all 4 concerns and elaborate upon how the regions could prepare for these concerns.

Level	Marks	Descriptors
3	7-8	Clear focus of question with use of relevant knowledge and examples in the response.
2	4-6	Response provides some analysis and evaluation. Most terms are accurately used. Generally well organised and structured.
1	1-3	Response is brief and fragmentary and lacks clarity.
0	0	No Creditworthy response

H1 essays

Question 3

a) Account for the variation in precipitation in the tropics. [9] [H1 only]

** Answers for this question should target the different climate types, namely the Af, Am, AW, BS and BW climate types.

Indicative content:

Af climate group (High annual precipitation with lack of seasonal variation in precipitation)

Heavy showers are due to the convergence of trade winds at the ITCZ and the subsequent rise of air to produce rain. Rainfall present throughout the year as the ITCZ is never too far off for any month.

Heavy showers in the afternoon as air parcels would have warmed sufficiently by then, leading to atmospheric instability and the generation of convective rain

Am climate group (High annual precipitation but with distinct seasonality in precipitation)

Presence of monsoons due to the shift of the ITCZ North or Southwards. Presence of trade winds. Summer monsoon in the case of India (wet) → due to the dominance of southwest monsoon winds

that blow across and pick up moisture over the Indian ocean towards the low pressure Asian landmass (Asiatic low)

Winter monsoon in the case of India (dry) → due to the dominance of northeast monsoon winds that blow across the Asian landmass as a result of high pressure air blowing out from the Siberian high towards the oceans. → Cold dry air from continent results in stable conditions developing and hence lack of precipitation

AW climate group (Moderate annual precipitation with distinct wet and dry season)

Precipitation can be explained by shift in the ITCZ that is caused by the movement of the overhead sun. The occurrence of heavy convectional storms provides the bulk of rainfall in four to five months, which is when the sun is above the savannas (summer).

(i.e. the wet season is during the summer months; the dry season is during the winter months when the ITCZ has shifted to locations further away)

When the ITCZ is near during the summer months → dominance of ITCZ nearby and near to rising arm of the Hadley cell → Convectional activity and atmospheric instability → Higher rainfall during wet season.

During the winter months, the ITCZ is shifted away → area is now near to the sinking arm of the ITCZ and stable atmosphere prevails → atmospheric stability → low or almost absence of precipitation during the wet months.

BS and BW climate group (low annual precipitation throughout the year)

Subsidence and atmospheric stability → These areas experience atmospheric stability throughout the year due to its location near to the sinking arm of the Hadley cell (subtropical high) → As a result of this characteristic → persistent high atmospheric pressure impedes convectional activity and the air from rising → lack of cloud formation → Dry conditions throughout the year.

L3 7-9	<ul style="list-style-type: none"> • Analytical and explanatory. • Clear focus of question. • Relevant knowledge and good use of examples.
L2 4-6	<ul style="list-style-type: none"> • Response includes analysis & explanation. • Weaker responses tend to more descriptive. • Generally well organised and structured but could be unclear at some parts. • Use of terms mostly accurate.
L1 1-3	<ul style="list-style-type: none"> • Response does not really address the question fully • Depth of knowledge and understanding is limited. • Response is fragmentary and lacks a clear structure and organisation • Unsupported, brief or incomplete assertions and/or arguments with some inaccurate use of terminology.

b) Discuss the effects of climate change on human activity. [16]

** Indicative content: Generally students should classify the impacts from both positive and negative aspects although there are more negative than positive impacts from climate change.

Effects on the Insurance Industry

- An industry very directly affected by the risks is the insurance industry. In recent years, insured losses have increased nearly fifteen-fold.
- An increase in extreme weather related insurance claim is expected from more extreme climatic events such as flooding, landslides and tropical cyclones

Effects on World Food Supply and Changes in the Biosphere

- It is projected that soil moisture will fall by 10% if global warming continues into the next 30 years.
- Crop patterns will shift to maintain preferred temperatures.
- Climatic regions in the midlatitudes could also shift polewards by up to 550km. This can lead to improved harvest and crop yields in the midlatitudes. Is this a positive economic impact?
- However, food security risks are greatest felt in areas near the coast as well as islands.
- Global warming may also lead to an increase in the world population living in malaria and dengue infected areas, especially in the subtropical and midlatitude areas.
- Though on the positive side, some regions which were previously not viable to grow certain food crops may be now warm enough for some of these crops to be grown. May increase food security in some of these regions but though it may be offset by other extreme climatic events.

Effects on Transport

- Roads, airport runways, railway lines and pipelines, (including oil pipelines, sewers, water mains etc) may require increased maintenance and renewal as they become subject to greater temperature variation. Regions already adversely affected include areas of permafrost, which are subject to high levels of subsidence, resulting in buckling roads, sunken foundations, and severely cracked runways.
- Threats to some railway lines that are built in China and Russia over permafrost may mean increase in maintenance on transportation cost. In addition issues relating to safety could arise as well.

Effects on Flood Defense

- Many of the world's largest and most prosperous cities are on the coast, and the cost of building better coastal defenses (due to the rising sea level) is likely to be considerable. Some countries will be more affected than others — low-lying countries such as Bangladesh and the Netherlands would be worst hit by any sea level rise, in terms of floods or the cost of preventing them.
- In developing countries, the poorest often live on flood plains, because it is the only available space, or fertile agricultural land. These settlements often lack infrastructure such as dykes and early warning systems. Poorer communities also tend to lack the insurance, savings or access to credit needed to recover from disasters.

Effects on Migration

- Some Pacific Ocean island nations, such as Tuvalu, are concerned about the possibility of an eventual evacuation, as flood defense may become economically unviable for them. Tuvalu already has an ad hoc agreement with New Zealand to allow phased relocation.
- In the 1990s a variety of estimates placed the number of environmental refugees at around 25 million. The Intergovernmental Panel on Climate Change (IPCC) estimated that 150 million environmental refugees will exist in the year 2050, due mainly to the effects of coastal flooding, shoreline erosion and agricultural disruption (150 million means 1.5% of 2050's predicted 10 billion world population).

Effects on Development

- The combined effects of global warming may impact particularly harshly on people and countries without the resources to mitigate those effects. This may slow economic development and poverty reduction, and make it harder to achieve their development goals. This is also especially so when the economies of these countries also depend heavily on agriculture, which is dependent on the weather. Hunger and disease are predicted to increase due to decreased rainfall and severe weather events, particularly in Africa.

Effects on Health

- The most direct effect of climate change would be the impacts of hotter temperatures themselves. Extreme high temperatures increase the number of people who die on a given day for many reasons: people with heart problems are vulnerable because one's cardiovascular system must work harder to keep the body cool during hot weather, heat exhaustion, and some respiratory problems increase. Higher air temperatures also increase the concentration of ozone at ground level.
- In the lower atmosphere, ozone is a harmful pollutant. It damages lung tissues and causes problems for people with asthma and other lung diseases.
- Rising temperatures have two opposing direct effects on mortality: higher temperatures in winter reduce deaths from cold; higher temperatures in summer increase heat-related deaths.
- The European heat wave of 2003 killed 22,000–35,000 people. The 2006 United States heat wave has killed 139 people in California as of 29 July 2006. In May 2015, India was struck by a severe heat wave. As of 3 June 2015, it has caused the deaths of at least 2,500 people in multiple regions. As recently as in 2018, heat waves which struck during the northern hemisphere summer caused forest fires to occur far north near the Arctic and extreme temperatures in Japan

Spread of Disease

- Global warming is expected to extend the favourable zones for conveying infectious disease such as dengue fever and malaria. In poorer countries, this may simply lead to higher incidence of such diseases. In richer countries, where such diseases have been eliminated or kept in check by vaccination, draining swamps and using pesticides, the consequences may be felt more in economic than health terms. The World Health Organisation (WHO) says global warming could lead to a major increase in insect-borne diseases in Britain and Europe, as northern Europe becomes warmer, ticks and sandflies are likely to move in.

Others

- Effects on more extreme events such as tropical cyclones as sea temperatures are warming up. These events are likely going to get increasingly extreme in terms of intensity and the

range that it covers → Thus this is more likely to have a greater effect on populations especially dense populations who live near the coast.

L4 13-16	<ul style="list-style-type: none"> • Strong evaluative elements that is relevant and comprehensive • Addresses the question • Accurate knowledge and depth of understanding • Argument is clear and well supported by relevant material • Use of terminology is accurate.
L3 9-12	<ul style="list-style-type: none"> • Response displays a sound evaluative element. Response addresses question and features accurate knowledge, reflecting depth of understanding. • Argument of discussion is coherent and supported by relevant materials. • Use of terminology is relevant and mostly accurate.

L2 5-8	<ul style="list-style-type: none"> • Response has some elements of evaluation but is broadly descriptive. Response exemplifies knowledge and understanding of the question and is generally relevant. • The weakest responses may lack balance and/or depth. • Response structure is broadly coherent but may lack clarity. • Use of terminology is inconsistent though generally accurate.
L1 1-4	<ul style="list-style-type: none"> • Responses shows little or no evaluation • Response lacks focus on the question and maybe largely irrelevant. • Fragmentary and lacks clarity. • Unsupported assertions and or/arguments with limited or no use of terminology.

Question 4

(a) Explain the different factors that affect the shape of storm hydrographs. [9]

** As a general guide, students should give factors coming from at least 2 categories. They need not talk about all factors but a good explanation will be needed. For 9 marks, at least minimally cover 5 factors while for 12 marks cover 6 factors

Indicative content:

Climatic Factors

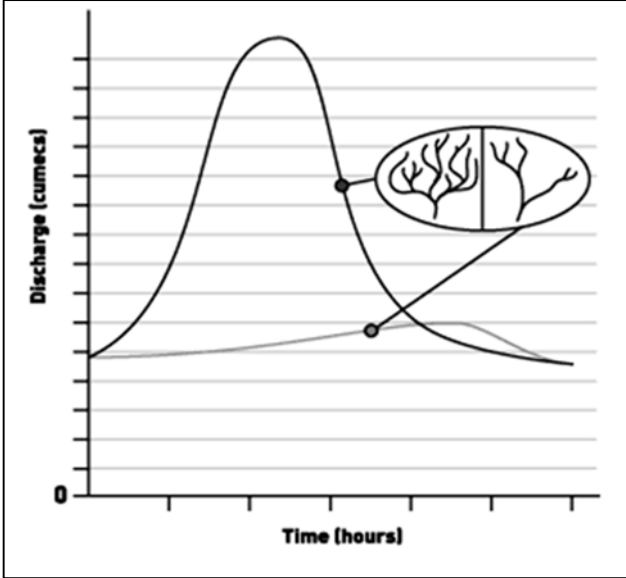
	Effect on hydrological processes	Implication on hydrograph
Rainfall intensity	<ul style="list-style-type: none"> • High rainfall intensity can quickly generate high amounts of HOF • Low rainfall intensity would allow infiltration but would not be able to generate HOF easily 	<p>Steep rising limb, short lag time, high peak discharge</p> <p>Gentle rising limb, long lag time, low peak discharge</p>

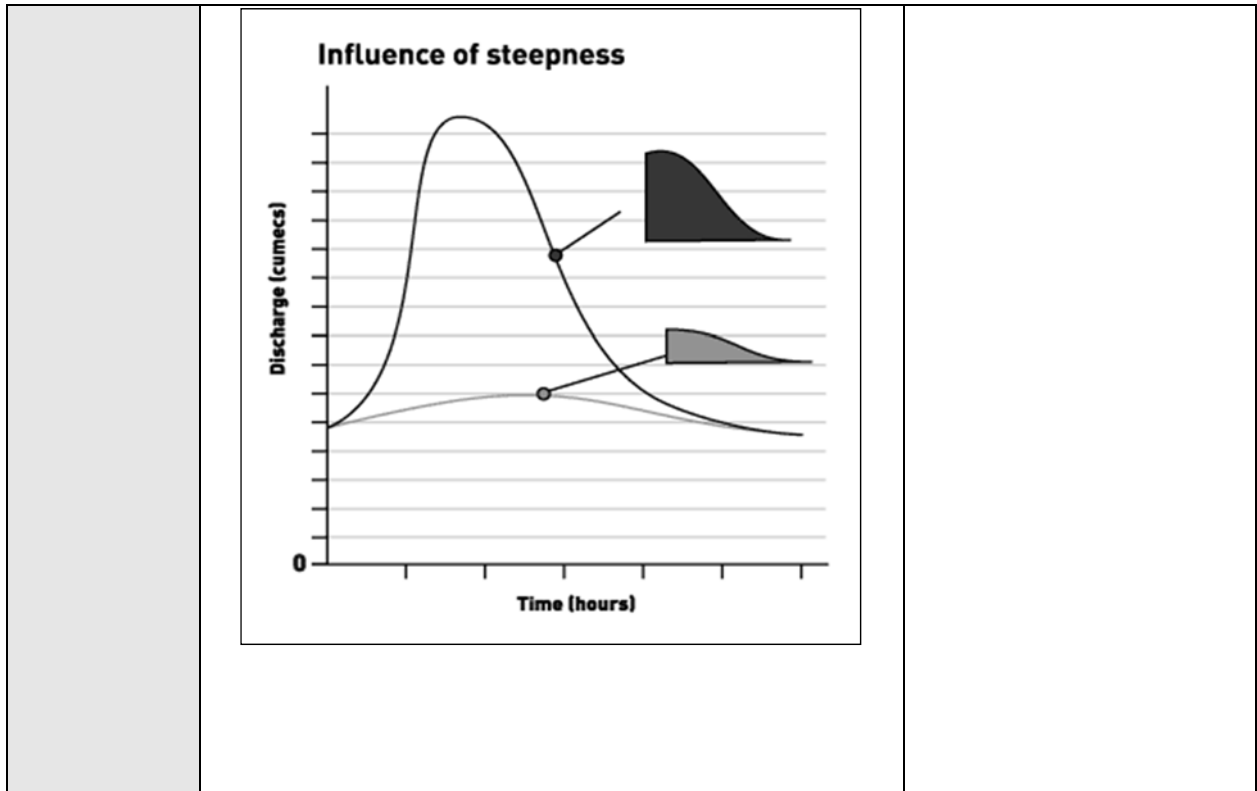
<p>Rainfall duration</p>	<ul style="list-style-type: none"> • Prolonged rainfall saturates the ground and tends to generate SOF • Rainfall of short duration may add to soil moisture but may not lead to saturation of the ground. Thus, little or no SOF may be generated. 	<p>Steep rising limb, short lag time, high peak discharge</p> <p>Gentle rising limb, long lag time, low peak discharge</p>
<p>Evapo-transpiration rate</p>	<ul style="list-style-type: none"> • Low rates of evapotranspiration results in high antecedent moisture (i.e. moisture present in the soil before rain event) and thus encourages the development SOF. • High rates of evapotranspiration results in low antecedent moisture which promotes high rates of infiltration. This slows down the generation of SOF. 	<p>Steep rising limb, short lag time, high peak discharge</p> <p>Gentle rising limb, long lag time, low peak discharge</p>
<p>[Extra information]</p> <p>Snowmelt</p>	<ul style="list-style-type: none"> • Rapid snowmelt (especially in summer) can quickly generate high volume of overland flows • Slow snowmelt may only gradually generate low volume of overland flows 	<p>Steep rising limb, short lag time, high peak discharge</p> <p>Gentle rising limb, long lag time, low peak discharge</p>

Drainage Characteristics

	Effect on hydrological processes	Implication on hydrograph
<p>Basin size</p>	<p>If a basin is small, it is likely that rainfall will reach the main channel more rapidly than in a larger basin. This is because the water will have a much further distance to travel in a larger basin.</p> <p>If a basin is small, the amount of rainfall received in the catchment area will also be low. This results in a lower amount of discharge in the main channel.</p> <p>THINK: If a small basin has shorter lag time and also lower peak discharge, will the rising limb also be affected by the basin size? (Hint: Draw the hydrographs and see!)</p>	<p>Shorter lag time in smaller basins</p> <p>Low peak discharge</p> <p>What is your conclusion? =)</p>

<p>Basin shape</p>	<ul style="list-style-type: none"> • In a circular basin, the tributaries often tend to come together and join the main stream approximately in the same place at the same time. Following a period of heavy rainfall, such 'centralized' merging of the streams results in a very large and very rapid increase in discharge of the main stream. • In an elongated basin, the tributaries tend to be relatively short, and tend to join the main stream at separate intervals. This means that after a period of heavy rainfall, the runoff from the lower tributaries will reach the gauging station BEFORE the runoff from the upper tributaries finally flow down and reach the gauging station. It also takes a longer time for runoff from the upper reaches of the basin to reach the gauging station. <div data-bbox="445 1032 1054 1666" data-label="Figure"> <p>The figure is a line graph titled "Influence of basin shape". The vertical axis is labeled "Discharge (cumecs)" and has several horizontal grid lines. The horizontal axis is labeled "Time (hours)" and has several vertical tick marks. Two hydrographs are shown. The first hydrograph, representing a circular basin (shown in a circular inset diagram), has a steep rising limb and a high, narrow peak. The second hydrograph, representing an elongated basin (shown in an oval inset diagram), has a gentler rising limb and a lower, broader peak. Dotted lines connect the peaks of the hydrographs to their respective basin diagrams.</p> </div>	<p>Steep rising limb, short lag time, high peak discharge</p> <p>Gentle rising limb, long lag time, low peak discharge</p>
<p>Drainage Density</p>	<ul style="list-style-type: none"> • In a basin with high drainage density, a large proportion of rainfall will become overland flow (surface runoff). This leads to a higher and more rapid increase in discharge. 	<p>Steep rising limb, short lag time, high peak discharge</p>

	<ul style="list-style-type: none"> In a basin with low drainage density, a large proportion of rainfall will most likely infiltrate and percolate into the ground. A small proportion of the rainfall will be channeled as overland flow. This leads to a smaller and slower increase in discharge. 	Gentle rising limb, long lag time, low peak discharge
Basin slope gradient	<p>In steep-sided upland valleys, steep slopes leave little time for infiltration and encourage generation of high amounts of surface runoff. Water is likely to reach the river more quickly than in gently sloping lowland areas, leading to rapid increase in discharge.</p>	Steep rising limb, short lag time, high peak discharge



Presence of Vegetation

	Effect on hydrological processes	Implication on hydrograph
Vegetation cover	<p>Leaves and branches increase the rate of interception, which reduces the rate of soil compaction caused the impact of falling raindrops. This increases infiltration rate! At the same time, the roots of plants and trees increase the lines of weaknesses in the ground, further increasing infiltration rate.</p> <p>As such, the presence of vegetation cover generally leads to decreased amounts of surface runoff (due to increased infiltration rate).</p>	<p>Gentle rising limb, long lag time, low peak discharge + Gentler falling limb (since higher infiltration leads to increased throughflow and baseflow)</p>

Geological Factors

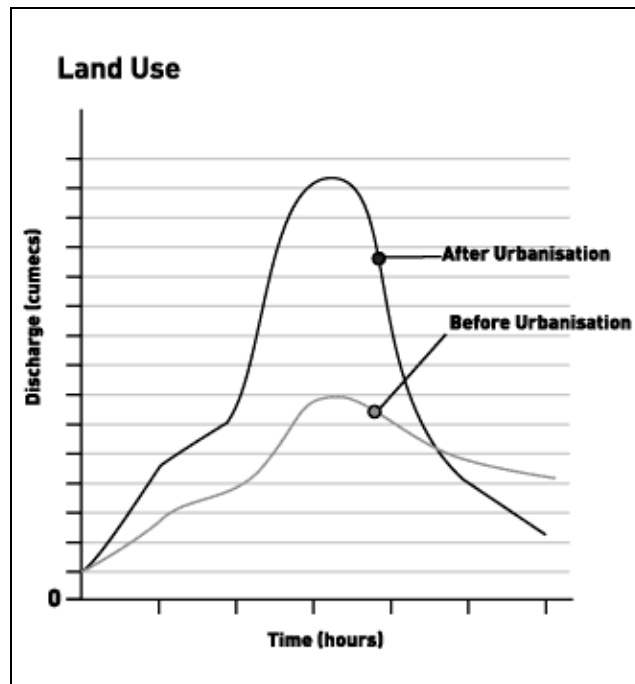
	Effect on hydrological processes	Implication on hydrograph
Soil or rock permeability	<ul style="list-style-type: none"> Impermeable rock or soil reduces infiltration and percolation, resulting in the generation of high volume of overland flow. 	<p>Steep rising limb, short lag time, high peak discharge +</p>

	<ul style="list-style-type: none"> The reduction in infiltration and percolation also decreases the amount of throughflow and baseflow into the river. Permeable rock or soil facilitates high infiltration and percolation, reducing the occurrence of overland flow. Instead, because of high infiltration and percolation, rainfall reaches the stream primarily via throughflow and baseflow. 	<p>Steeper falling limb</p> <p>Gentle rising limb, long lag time, low peak discharge + Gentler falling limb</p>
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Human Factors

	Effect on hydrological processes	Implication on hydrograph
Dams and reservoirs	Dams DO NOT affect the amount of surface runoff <u>generated</u> , BUT they regulate the flow of water and are also able to store a sizeable volume of water in their reservoirs. Generally thus, dams reduce the amount of discharge into the main river or channel.	Lower peak discharge
Deforestation	<p>The reduction of vegetation cover produces the opposite effects to what was mentioned in the above section on "Vegetation Cover". Generally, reduction in forest cover leads to:</p> <ul style="list-style-type: none"> ○ Reduced infiltration rate ○ Higher surface runoff <p>[Note: <u>Afforestation</u> is the counter-process to deforestation, and INCREASES vegetation cover.]</p>	Steep rising limb, short lag time, high peak discharge
Urbanisation	<p>Urbanisation produces large amounts of impermeable surfaces made of concrete, tarmac, and metal. Water cannot infiltrate through such materials, and this leads to a rapid generation of surface runoff.</p> <p>Moreover, drains and canals carry water more quickly to the nearest river.</p>	Steep rising limb, short lag time, high peak discharge

As a result, rainfall reaches the river extremely quickly, greatly reducing lag time and also massively increasing peak discharge.



b)* The causes of floods are mainly attributed to human rather than natural causes. Discuss the validity of this statement. [16]

Causes of floods may be attributed to both human and as well as natural causes. However it must be noted that the factors have to be direct factors. Factors such as urbanisation and deforestation can be discussed but only serve as factors contributing to worsening (acerbating factors) and should not be discussed as direct causes of floods.

Indicative content:

Natural causes of floods

Intense rainfall and tropical cyclones

- Intense rainfall will result in **infiltration-excess flow (IEF)** where rainfall intensity exceeds the infiltration capacity of the ground.
- The increase in IEF causes river discharge to increase, and this can lead to the formation of floods.
- High rainfall intensity is associated with **convective rainfall** and especially in tropical regions. The formation of **tropical cyclones** also generates short but intense rainfall.
- Also, during intense rainfall, the impact from falling raindrops tends to compact unvegetated soil particles, and cause the pore spaces to be sealed (recall: raindrop effect). This reduces infiltration capacity, further increasing the likelihood of IEF being generated.

Prolonged rainfall

- Prolonged rainfall leads to the increase in **soil moisture storage** and **groundwater storage** via infiltration and percolation respectively. The **ground eventually becomes saturated** with water, and over time, **saturation overland flow (SOF)** is generated.
- The increase in SOF causes river discharge to increase, and this can lead to the formation of floods.
- Prolonged rainfall is usually experienced in **tropical monsoon regions**, during the wet (monsoon) season.

Seasonal rainfall during wet season (monsoon season)

- **Tropical monsoon regions** usually experience a distinct **wet season** or **monsoon season**, where there is a higher amount of rainfall. These regions typically experience **prolonged rainfall** (see above) in the wet season, which **generates SOF**.
- Most of the time, countries in such regions are prepared for the increased rainfall during the wet season. However this seasonal increase in rainfall can still lead to the formation of floods, especially if:
 - The wet season is **unusually long or extended**
 - The **intensity of rainfall is higher than expected**
 - The wet season **arrives much earlier than expected**
- The above 3 cases tend to result in **tremendous increases in discharge**. Rivers that are unable to cope with such large increases in discharge will therefore overtop their banks and flood the surrounding area.
 - Eg: Brahmaputra River in India and Bangladesh and Yangtze River in China are prone to flooding during the monsoon seasons. In India, up to 70% of the annual rainfall occurs in 100 days in the summer south-west monsoon

Snowmelt

- **Snowmelt or meltwater** can **greatly increase the discharge** in the river, and cause the river to overflow its banks and flood.
- Snowmelt can be generated by:
 - **Warmer temperatures during spring/summer**
 - **Volcanic events**
- In the spring or summer months in temperate regions, **warmer temperatures can cause snow or ice to melt**, producing large amounts of meltwater.
 - E.g. In December 2008, the state of Washington (USA) experienced heavy snowfall. By January 2009, the heavy snowfall began to rapidly melt, producing enormous amounts of meltwater and generating extremely heavy floods.
 - E.g. In the Yukon River in Canada, the most common cause of flooding is the melting of snow and ice in spring.
- **Rising magma** can heat up the sides of a volcano, causing ice and snow on the flanks on the volcano to melt. **Lava flows and hot gases** from volcanic eruptions can also melt snow and ice, and generate meltwater.
 - E.g. The 2010 volcanic eruption in Iceland produced devastating flash floods, as hot gases from the volcanic eruption melted huge chunks of ice from the Eyjafjallajökull glacier.
 - E.g. The 1985 eruption of the Nevado del Ruiz volcano in Columbia melted ice and snow on the sides of the volcano, producing devastating floods and lahars.

Storm movement

- Storm movement in a catchment area can either amplify or dampen a flood wave.
- Storms that **move down-valley** (i.e. moving from the upper reaches of the basin to the lower reaches) are more likely to cause flooding. This is because such direction of storm movement tends to **amplify the peak discharges downstream**.
 - E.g. The disastrous 1996 flash flood that occurred in Buffalo Creek, Colorado (USA) was due to 2 reasons. Firstly, a severe wildfire caused extensive deforestation in the basin, leading to reduced infiltration and increased surface runoff. Secondly, the storm (that produced the surface runoff) moved down-valley, tremendously amplifying the peak discharges, and hence causing a severe flash flood.

Unusual climatic phenomena

- **Climatic phenomena** such as El Nino and La Nina have resulted in **unexpected occurrences and amounts of rainfall** and these have, in some cases, resulted in floods.
 - El Nino – Said to have played a role in the 1993 Mississippi River flood.
 - La Nina – Said to have played a role in the floods in Sudan and Bangladesh in 1998

Human causes of floods

Dam failure

- Dams are able to **regulate the flow** of water to the downstream areas, providing them with water even during the dry seasons.
- However, dams are also causes of floods if they **fail or collapse**.
- Dam failure can occur due to:
 - **Unexpectedly-high amounts of rainfall**
 - **Sedimentation in reservoir**
 - **Engineering failures**
- Unexpected rainfall. The reservoirs behind dams store water during the rainy season (this water is typically released during the dry season). However, in some cases, the rainy season experiences an unusually high amount of rainfall. The reservoir **may not be designed to hold such a large amount of water**, and the reservoir overflows. Downstream areas receive a sudden surge of water, and flooding occurs.
- Sedimentation in reservoir. Improper maintenance of the dam may lead to the accumulation of sediments in the reservoir. This **reduces the holding capacity** of the reservoir. When this happens, the reservoir is unable to hold large amounts of water, and the dam is more likely to overflow during times of heavy rainfall.
- Engineering failures. In some cases, **leakages** in the dam structures cause the dam to **release water too quickly**. In more severe cases, **engineering failures** may cause the dam to even collapse. In both circumstances, downstream areas receive a sudden surge of water, and flooding occurs.
 - E.g. Banqiao Dam, China
 - E.g. Teton Dam, USA
 - E.g. Val di Stava Dam, Italy
- ** Students can also bring in or feel free to talk about recent case study of dam failure in Laos (2018) which resulted in flooding downstream and loss of lives

Levee failure

- Levees refer to **embankments** on the river bank. Levees can be **natural or artificial**.

- Artificial levees are built to increase the holding capacity of the river channel, and thus prevent overflowing of the river.
- However, levees are also causes of floods if they **fail or collapse**.
- Levee failure can occur due to:
 - **Overflowing of levees,**
 - **Breaching or collapse of levees.**
- Overflowing of levees. In some cases the amount of discharge is extraordinarily high (due to high rainfall or other circumstances), and **far greater** than what the levees were **originally designed to contain**. This causes the river to overflow the levees, and flood the surrounding areas.
- Breaching or collapse of levees. Increased discharge in the rivers also leads to both increased velocity and increased fluid pressure in the channel. Firstly, the increased velocity can increase the rate of **erosion at the base of the levee structure**, causing it to collapse. Secondly, the increased fluid pressure against the levees may also force water to **“breach” the levees**, eventually causing the levees to collapse.

Other contributing reasons though not direct reasons to floods:

- **Deforestation**
 - Deforestation can worsen floods by increasing surface runoff as soil becomes compacted due to removal of trees and vegetation → Increase in IEF → Water reaches channel faster → increase in channel flow → Water overflows channels → flooding
 - Can also increase erosion → Mass movement → holding capacity of river is reduced → flooding occurs due to reduced capacity of river
- **Urbanisation**
 - Concretised surfaces → Impermeable surfaces → Higher IEF → Water reaches channel faster → increase in channel flow → Water overflows channels → flooding
- **Pluvial floods in Urban areas**
 - Water may sometimes be channelled to low points in the city’s terrain (also known as ‘ponding’) → This may happen if drainage systems are choked or rainfall is too intensified. Can happen as most urbanised areas have little permeability

Question 5

(a)

DC	LDC
<p>1. <u>Influence over the world economy</u> Rise of important ‘world’ and ‘global’ cities with great economic and political influence internationally. The good thing is they are trend setters but this could mean they would affect global economic trends as well. Could be targets of terrorism (e.g. NY Twin Towers & London Bombings)</p> <p>2. <u>Over-concentration of global capital:</u> Cities have high concentration of financial services such as banking and international</p>	<p>1. <u>Uneven development & under-development:</u> Rise in mega-cities and primate cities and the negative backwash effects on the country. This could lead to uneven development and rural under-development in the LDCs.</p> <p>2. <u>Speed of growth:</u> Rate of urban growth is so rapid that it is 3 times faster than Europe when it first started urbanising. Measures by the government are not quick enough to compliment the rate of growth. However, this rapid and massive scale of urban growth has caused many problems such as the lack of housing; water sanitation facilities and many other problems for LDCs.</p> <p>3. <u>Size of Population (Scale of the problem)</u> For every city-dweller in the DCs, there are 4 city-dwellers in the LDCs. The greatest numbers of large cities are found in LDCs. By 2015, 24 of the 30 largest urban agglomerations will be in LDCs.</p>

<p>business. They might attract more investments compared to other countries.</p> <p>3. <u>Rising cost of living</u> negating the quality of life.</p> <p>4. <u>Increasing Income disparity</u> leading to residential segregation and social tensions.</p>	<p>4. <u>Lack of resources:</u> The greatest challenge for the government of these poorer countries is to improve the lives of the people living in these cities, given the lack of resources and corruption levels in LDCs. The LDCs are becoming urban before they attain a certain level of affluence and development levels associated with urbanisation. This could mean massive social problems which will be shown in many forms of urban deprivations in later lectures of housing and social-economic polarisations.</p>
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Strategies to manage non-hazardous solid waste in DCs and LDCs

[Usually countries adopt a variety of strategies to manage non-hazardous waste]

1. Landfill

- Landfill is a very common waste disposal method but it is not a long term solution. Landfills have to be carefully designed to prevent contamination of groundwater, air and land. Usually the sites are barren and non-productive brown-field sites.
- However, in many land-scarce urban locations, land is precious and expensive, the amount of land is limited and many landfills are running out of space. Once the landfill has exceeded its carrying capacity, it might not be able to be redeveloped as it could be toxic or polluted.
- In Singapore, for instance to reduce land for landfills, the government has been trying to look at other innovative means to reduce waste sent to the landfills. Pulau Semakau is a unique offshore landfill that is constructed in the sea and operated since 1999, about 200,000 tonnes of solid waste and all incinerated ash are sent to the landfill annually to 2035.
- The island covers a total area of 3.5 square kilometres and has a capacity of 63 million m³. The landfill is filled mainly with ash from Singapore's 4 incineration plants. The landfill was designed to be clean, free of smell and is actually quite scenic. Recreational activities are allowed on the island. And care was done during its construction to reclaim the sea into land, to reduce the damage done to the corals. The landfill is lined with impermeable membrane and clay and any leachate produced is treated a plant onsite the island. Regular water testing is also carried to ensure its safety to prevent leakages.

[Used in combination with Taxes]

- In the UK, to reduce waste sent to the landfills, they have implemented a Landfill Tax since 1996.
- In Sweden, less than 1 per cent of Swedish household waste was sent to landfill last year or any year since 2011.
- There is a ban on landfill in EU countries, so instead of paying fines, governments have to look at ways to reduce the waste generated.

2. Incineration

- Incineration is the burning of waste at high temperatures. The process can release harmful emissions and gases into the atmosphere. Such emissions can be reduced via improving combustion techniques and fitting pollution control devices.
- The burning of waste to produce energy can be adopted in incineration.

- Incineration can also reduce mass of waste from 95-96%, hence reducing storage space in landfills that are fast filling up. Incineration merely reduces the waste sent to landfills but landfills are still needed.
- Sweden is a country known for its high ability to sort and recycle waste and its incineration plants lack garbage. The incineration plants produce electricity to supply 250,000 homes and heating for 950,000 homes.
- Since 1991, Sweden was one of the first countries to implement **a heavy tax on fossil fuels** and its incineration plants generates electricity from renewables.
- Incinerated ashes constitute 15 per cent of the weight of waste before burning. From the ashes, metals are separated and recycled, and the rest, such as porcelain and tile, which do not burn, is sifted to extract gravel that is used in road construction. **[Recycling]** About one per cent still remains and is deposited in rubbish dumps. **[Landfills]**
- The smoke from incineration plants consists of 99.9 per cent non-toxic carbon dioxide and water, but is still filtered through dry filters and water. The dry filters are deposited. The sludge from the dirty filter water is used to refill abandoned mines.
- The Swedish government also worked on educating the people to change their mindset and habits and **recycle and reuse**, to generate less waste.
- There has been a **national campaign** called “**Miljönär-vänlig**” who has been around for several years to promote **repairing, sharing and reusing**. **Recycling stations** are as a rule no more than 300 metres from any residential area. Most Swedes separate all recyclable waste in their homes and deposit it in special containers in their block of flats or drop it off at a recycling station.
- Swedish households sort their newspapers, plastic, metal, glass, electric appliances, light bulbs and batteries. They also separate food waste and all of this is reused, recycled or composted.
- Rubbish trucks are often run on recycled electricity or biogas. Wasted water is purified to the extent of being potable. Special rubbish trucks go around cities and pick up electronics and hazardous waste such as chemicals.
- They government has a cohesive **national recycling policy** that engages the **private sector** as well, where they import and burn waste to produce energy for the national heating network to combat the freezing Winters in Sweden.
- Other examples, private companies like H&M has begun accepting used clothing from customers in exchange for rebate coupons in an initiative called Garment Collecting.
- The Optibag company has developed a machine that can separate coloured waste bags from each other. People throw food in a green bag, paper in a red one, and glass or metal in another. Once at the recycling plant, Optibag sorts the bags automatically. This way, waste sorting stations could be eliminated.
- The southern Swedish city of Helsingborg even fitted public waste bins with loudspeakers playing pleasant music – all in the name of recycling.

3. Taxation

- This method tries to deter waste production by passing the cost of waste management to the consumers. This hopes to reduce waste and increase recycling rates. Cost can be passed on to consumer by increasing retail products for its packaging. This method is also often combined with other methods such as **recycling**.
- For instance, the UK has this environmental tax called the Landfill Tax of 1996, where to avoid the extra cost, the country commits to reducing waste through industrial legislation and increasing the cost of disposing waste to landfills. However, UK has not been able to reduce the waste, hence to reduce the

money they have to pay for the Landfill tax, the UK pays transport cost to have their waste transported to Sweden's incineration plant.

- The Landfill tax is also a means for the UK to reach the EU target that UK has committed to increase the percentage of waste generated in the country to 50% in 2020. UK hasn't reached their goal yet, recycling in the UK has peaked at around 45% in 2014. EU target is 65% of the waste be recycled by 2030.
- The UK government also has invested millions into recycling facilities and energy recovery plants. This also indirectly create jobs.

4. Recycling & Recovery

- In many LDCs, many rural-urban migrants have difficulty securing employment and many end up scavenging through waste sites to obtain any materials that they can sell.
- Also in many LDCs, due to the sheer population size and lack of proper waste facilities, much of the waste is disposed of on the streets and the sewers.
- To solve the issue which has socio-economic and environmental impacts, innovative means to incorporate these waste-pickers to their waste management schemes. In Buenos Aires, the government has legalized the informal garbage collectors recognizing their contribution to recycling and urban sanitation.
- In Bogata, waste pickers have formed co-operatives to bid for municipal waste collection contracts.
- Bandung has an 'integrated resource recovery' strategy for waste management based on co-operation between the municipal authority, NGO and a local community of scavengers. The program was able to help provide shelter upgrading, health-care provisions, toilet construction and various economic activities such as composting of organic waste and seed farming. The plan is to get aid from government such as tax incentives for industries.
- The key to sustainability it seems is to draw linkages between socio-economic and environmental goals.
- In DCs, there are more formalized recovery and recycling schemes for metals and other materials like paper and glass. For instance, in Germany, there are numerous recycling stations at supermarkets for consumers to return their plastic and glass materials for money.
- Recycling can reduce the amount of waste sent to landfills and incineration.
- Less raw materials are needed and this reduces negative pollution and conserves resources from future generation.
- This strategy also creates employment opportunities (economic) and have good environmental and social benefits.

Question 6

(a)	Explain the reasons to account for urban re-imagining in countries at high levels of development.	[9]			
	<p>Causes</p> <table border="1" data-bbox="469 1720 1278 2000"> <tr> <td data-bbox="475 1720 1278 1749">Economic Changes</td> </tr> <tr> <td data-bbox="475 1756 1278 1877"> <ul style="list-style-type: none"> • Deindustrialisation & offshoring– global shift of manufacturing growth from the west to the LDC • Move from manufacturing to tertiary industries (Tertarisation) </td> </tr> <tr> <td data-bbox="475 1883 1278 2000"> <ul style="list-style-type: none"> • Decentralisation of industries out of congested cities to Greenfield sites and industrial estates on the periphery. Companies might find peripheral location cheaper or due to proximity to skilled labour in suburbs. High cost of </td> </tr> </table>	Economic Changes	<ul style="list-style-type: none"> • Deindustrialisation & offshoring– global shift of manufacturing growth from the west to the LDC • Move from manufacturing to tertiary industries (Tertarisation) 	<ul style="list-style-type: none"> • Decentralisation of industries out of congested cities to Greenfield sites and industrial estates on the periphery. Companies might find peripheral location cheaper or due to proximity to skilled labour in suburbs. High cost of 	
Economic Changes					
<ul style="list-style-type: none"> • Deindustrialisation & offshoring– global shift of manufacturing growth from the west to the LDC • Move from manufacturing to tertiary industries (Tertarisation) 					
<ul style="list-style-type: none"> • Decentralisation of industries out of congested cities to Greenfield sites and industrial estates on the periphery. Companies might find peripheral location cheaper or due to proximity to skilled labour in suburbs. High cost of 					

		<p>development in CBD locations and peripheral locations offer lower costs.</p> <ul style="list-style-type: none"> This also leads to suburbanisation as the rich move away from the city centre. Unemployment – especially for blue-collar workers, jobs might be also be more for females 	
(b)	To what extent have urban re-imaging strategies benefited everyone living in the cities of countries at high levels of development?		[16]

▪ **Define Key terms:**

- **Urban Re-imaging strategies** → 24 hour cities, flagship development project, heritage tourism & cultural tourism

*(Re-imaging strategies are part of **Gentrification** efforts to project a better image of the inner city to attract investment back so as to reverse the negative effects of inner city decline)*

▪ **Gentrification projects aim to:**

- Redistribute income within the city through the 'trickle-down' effect. I.e. trickle down of benefits into the pockets of the most disadvantaged through job creation, servicing visitors and incoming visitors
- Increased consumer spending can spur the multiplier effect as other related and non-related industries develop
- Reverse urban decline via the promotion of economic vitality, improving social conditions, social integration, upgrading & improving physical environment of city

▪ **Causes of urban decline**

1. De-industrialisation
2. Economic decline
3. Suburbanisation
4. Influx of migrants



Re-imaging hopes to bring back economic investments to the city centre, however, redistribution of income is not uniform.

Negative effects of inner city decline:

Economic, social and environmental decline

- Lack of services
- Unemployment
- Drugs and crime
- Urban decay
- Road congestion and pollution
- Lack of green space

Suggested Thesis Points (Body): Using the case study of Sheffield

Benefits in terms of economics and physical infrastructure, likely to be benefiting only the middle class people.	Didn't really benefit the poor.
<ul style="list-style-type: none"> • Overall there has been a stunning transformation in the visual appearance of the area • 1.7 billion pounds of public sector investment attracted a further 6.1 billion of private sector investment, mainly in new businesses, office development and housing 	<ul style="list-style-type: none"> • Most of the new housing is built with the encouragement of the LDDC; housing is very expensive and well beyond the reach of the original inner city residents. This has led to major gentrification • Although 7,700 council houses were refurbished, relatively little was done for locals particularly in

<ul style="list-style-type: none"> • The population of the area increased from 39,000 in 1981 to 68,000 in 1995 • 140 million was spent on reclaiming a total of 7 sq kilometres of derelict land • 950 million was spent on improving access to the area, including new roads, the Docklands Light Railway and the London City Airport • The number of businesses located in the area increased from 1000 in 1981 to 2350 in 1995 and the number of jobs from 27,000 to 66,000 • 19,000 new homes were built refurbished • 7700 council houses were refurbished (Some help for the poor but insufficient) 	<p>the early years of the LDDC.</p> <ul style="list-style-type: none"> • Most of the new jobs (in areas such as financial services and the media) need highly skilled or experienced people. Few opportunities have opened up for the relatively unskilled inner city residents • The influx of highly paid professional population has increased socio-economic inequalities and highlighted the poverty in the social housing estates • The rapid changes has destroyed the traditional close-knit 'Eastenders' community • Inadequate public expenditure on transport infrastructure means that transport links to the area are inadequate.
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Suggested Points for Conclusion:

- Analyses that there are global, structural and systemic problems that re-imaging cannot fully address
- Re-imaging strategies are merely marketing strategies that change the physical landscapes via redevelopment but often they do not solve root problems of inner city decline of social inequality and economic restructuring

H1 Generic Level Descriptors for 9m SEQ sub-part (a)

Level	Marks	Descriptors
3	7-9	Response is consistently analytical and explanatory rather than descriptive. There is a clear focus on the question. Depth of relevant knowledge and understanding exemplified throughout. The response is coherent and the use of terminology is accurate.
2	4-6	Response includes analysis and explanation but is generally dominated by description for weaker responses. Response reflects relevant knowledge and understanding of the question. Response is structured and organised satisfactorily but may be unclear in parts. Use of terminology is generally accurate.
1	1-3	Response does not address the requirements of the question fully. Depth of knowledge and understanding shown is limited. Response is generally fragmentary and lacks a clear structure and organisation. There may be many unsupported, brief or incomplete assertions and/or arguments with some inaccurate use of terminology.
0	0	No creditworthy response.

H1 Generic Level Descriptors for 16m SEQ sub-part (b)

Level	Marks	Descriptors
4	13–16	Response shows strong evaluative elements. Evaluation is relevant and comprehensive. Response fully addresses the question and features accurate knowledge, reflecting depth of understanding. The argument or discussion is coherent and well-supported by relevant material. Use of terminology is accurate.
3	9–12	Response displays a sound evaluative element. Response addresses the question and features accurate knowledge, reflecting depth of understanding. The argument or discussion is coherent and supported by relevant material. Use of terminology is relevant and mostly accurate.
2	5–8	Response has some elements of evaluation but is broadly descriptive. Response exemplifies knowledge and understanding of the question and is generally relevant. The weakest responses may lack balance and/or depth. Response structure is broadly coherent but may lack clarity. Use of terminology is inconsistent though generally accurate.
1	1–4	Response shows little or no evaluation. Response lacks focus on the question and may be largely irrelevant to it. Response is fragmentary and lacks clarity. There may also be unsupported assertions and/or arguments with limited or no use of terminology.
0	0	No creditworthy response.