2018 C2 Prelims H1 Geography ANSWERS

Section A

Theme 3 : Geographical Investigation

1 Resource 1 shows a relief map of Thomson Road and the surrounding area. Resource 2 shows part of the recording sheet used in the investigation. Resource 3 shows an image from Google Earth. Resource 4 shows an image of land use along Lorong 3 Tao Payoh.

(a) Suggest a suitable hypothesis for the group investigation and explain why the hypothesis is clearly defined and at a suitable scale. [4]

Example of hypothesis:
A steeper slope will have a lower infiltration rate

Independent variable: slope angle
Dependent variable: infiltration rate

Suitable scale:
- Area is small enough for the group to conduct their study as they can split into 3 groups of about 7 students each

(b) Select **two** areas A, B or C outlined in Resource 1 and suggest why the group might have chosen those areas for their comparative study. [4]

- Areas B and C
- Area B has high relief (50m) and low relief (11m) and would be good to study the effect of steep slopes
- Area C has relative flat and low relief (about 18 – 20m) and would be useful to study the effect of gentle relief
- Area C is also where a housing area is located and the effect of land use can be analysed as well

(c) Draw a sketch of a graph to show how the data on infiltration rate for slope sections B1 bad B2 in Resource 2 can be represented and explain its advantages. [6]

- A Line graph can be constructed with time from start and infiltration rate as the two axes
- The line graph is a clear representation of the relationship between time and infiltration rate and easy to understand. The lines can be coloured to show the contrast between them.
- Comparisons between the graphs can be made and analysed

(d) Evaluate the usefulness of the data shown in Resource 3 in the investigation. [4]

- Reflects nature of surface
  - Built-up areas
  - Vegetation cover
  - Roads
- Shows elevation and angle of slope

However,

- Points to locate the specific spots on the map and link to the cross-section are not sufficient. Hence, it is difficult to link the cross-section and the map

(e) With reference to Resource 4, discuss how data on the effect of land use on floodrisk shown in Area C in Resource 1 can be collected. [7]

- Area C is a housing area
- Use of a map to record information on
  - Roads
  - Vegetation
  - Paths
  - Drainage
  - Buildings
- Survey residents regarding the occurrence of floods both small and large scale in the area.
- Measure the infiltration rate of different surfaces

Include how the students should conduct themselves as they collect data
- Not to destroy the surrounding vegetation
- Not to make noise and disturb the residents
- Watch for traffic
- Do not put pressure on residents to take the survey
- Explain the purpose of the study clearly

Section B

Theme 1 : Climate Change and Flooding

The El Ninõ Southern Oscillation and its impacts on Southeast Asia

2 Resource 5 shows average sea surface temperature anomalies (°C) between July-August 2015. Resource 6 shows wind speed anomalies (m/s) July to August 2015. Resource 7 shows sea level anomalies in February 2016. Resource 8 shows rice production in Southeast Asia. Resource 9 shows the effects of an El Nino shock on real GDP.

(a) Describe the distribution of sea surface temperature anomalies (°C) in Pacific Ocean in Resource 5. [3]

- High SST anomaly of 2°C on Eastern Pacific and towards the north near North America
- SST decreases towards Western Pacific about -0.5°C to -1°C anomaly
- Lower SST anomaly in the NW

(b) With reference to Resource 5, explain the possible effects of the El Nino Southern Oscillation on rainfall amount and distribution in the region. [6]

Eastern Pacific
- Warmer
- Lower pressure
- Associated with rainy weather and storms

Western Pacific
- Cooler

- Higher pressure
- Drier and may experience drought

Due to:
- Upwelling cold Peruvian current in the Eastern Pacific weakens
- High pressure conditions weakens as well
- Easterly trade winds weaken
- This causes the water from the Western Pacific to slosh back and SST increases

(c) Explain the relationship between wind direction and sea level anomalies shown in Resources 6 and 7 respectively. [4]

- Higher sea level increase towards Central and Eastern Pacific and winds become westerly
- Change in air pressure in eastern (LP) and western Pacific (HP)
- Winds blow from HP to LP (shown in Resource 6)
- Resource 7 – sea level higher as sea water is pushed towards the Eastern Pacific

(d) With reference to Resources 8 and 9, compare the impacts of an EL Nino event on Thailand and Indonesia. [4]

- Thailand shows a gentle but increasing trend between 1995 and 2012. The rice production does not seem to be affected by the El Nino.
- Indonesia also similarly shows an overall increase in rice production. However, it is quite distinctly affected by El Nino events as there was a clear dip of about 3 million metric tons when the El Nino events occurred in 1997/98 and 2009/10.

(e) With reference to Resources 8, 9 and your own knowledge, assess the extent of the impacts of El Nino events on Southeast Asia. [8]

- Resource 8 – impacts on rice production affects supply for local consumption as well as supply to global markets
- Resource 9 – Indonesia suffered a fall in GDP growth of -0.2 percentage point due to EL Nino events. However, Singapore, Thailand, Philippines and Malaysia experience an increase with Thailand having the highest increase.
    - Indonesia is affected the worst by the El Nino due to the decrease in rainfall
- When dry conditions or drought occurs, farmers may turn to burning to clear the forests and this results in transboundary haze affecting a few countries and the health of thousands of people
- Drier conditions will affect water supply and worsen water scarcity issues

Section C

Theme 1 : Climate Change and Flooding

3 **(a)** Explain the main differences in the characteristics of tropical rainforest (Af) and tropical savanna (Aw) climates. [9]

- Explain differences in mean annual temperature, annual temperature range, total annual rainfall and rainfall distribution
- Reasons for differences :
    - Aw lies at a high latitude, hence the mean annual temp will be lower and seasonal temp is higher
    - The ITCZ also affects the areas seasonally during summer causing summer rain and winter dryness

(b) Evaluate the role of the Hadley Cell in influencing the tropical climates. [16]

- Hadley Cell is extremely important as the ITCZ is part of the circulation
    - The ITCZ brings rain to the tropical climates such as Af climates. It also influences the monsoon winds and affects the Am climates. It also brings seasonal rainfall to Aw climates
- Hadley Cell is also important as the STHP belt is part of the circulation
    - The STHPB influences mainly the tropical desert climate bringing it dry conditions all year
- Other factors
    - Topography – link to monsoon winds and orographic rain
    - Ocean currents and the ENSO
    - Aspect

4 **(a)** Compare the drainage basin water balance in the humid and arid tropics. [9]

- The drainage basin water balance in the humid tropics will generally have surplus as compared to the deficit in the arid tropics.
- All the flows and storages in the humid tropics will generally be higher

(b) Discuss the usefulness of flood hydrographs in the study of the flows and storages in a drainage basin. [16]

- Draw the flood hydrograph and explain its characteristics
- Flood hydrographs are useful as they reflect the flows of water in a drainage basin in the event of a storm
- They can help explain how the nature of the drainage basin make affect the flows and storages of water, such as
    - vegetation cover
    - slope angle
    - land use
    - geology
- However, it does not help to pinpoint the exact reasons for flows as it reflects as general response to the rainfall event

Theme 2 : Urban Change

5 **(a)** Explain the main reasons for traffic congestion in countries at low levels of development. [9]

Reasons can include:
- Poor infrastructure, poorly paved roads, narrow roads
- High levels of private car ownership
- Poor public transport
- Poor traffic control
- Rapid urbanization outstripping improvements in infrastructure

(b) Discuss the effectiveness of attempts to manage the issue of traffic congestion. [16]

- Select any strategies that decrease private car ownership (e.g. COE), increasing road capacity, improving public transport, improving pathways for alternative forms of movement and transport such as walking and cycling

6 **(a)** Explain why there are different indices used to measure 'urban liveability' in cities. [9]

- Different indicators are selected to form differing indices as liveability is a relative and subjective concept. It can hold different meanings for people living in different cities in different parts of the world.
- Some organizations have their own agenda in the creation of the indices such as EIU. Hence, the choice of and emphasis on different indicators

(b) To what extent can the needs of different social groups in the city be met? [16]

Elderly:
- creation age-friendly cities
- meeting the social needs of the elderly by increasing social interaction such as senior activities centres
- Meeting the needs for healthcare and mobility by providing subsidies
- Most needs of elderly in DCs can be met as reflected by the development of successful age-friendly cities
- However, there needs to be more emphasis on those individuals who are more reclusive and prone to suicide

Youths:
- The social, economic (employment), physical needs of youths can largely be met
- However, it is difficult to avoid the issues with stress experienced in schools as academic performance is tied closely to urban societies and many countries find it difficult to delink them
- With the advent of the internet, it is also difficult to address the issues of cyberbullying as the reach of the internet is very wide and elusive
- In some societies, infantilisation is also an issue.