GEOGRAPHY

Mark Scheme Advanced Physical Options

9696/2 June 2002

Tropical Environments

1. (a)

High overhead sun gives rise to relatively small diurnal and seasonal temperature changes. Seasons are marked more by changes in level of ppt., which also mark the distinction between humid and seasonally humid. (i.e. existence of a marked dry season.) Ppt is largely convectional due to daily surface heating and afternoon thunderstorms. Good candidates (10 –8) will develop squall clusters, ITCZ movement and easterly wave effects. L2 (7-5) will be more descriptive than explanatory whilst L1 (0-4) will get little further than wet/dry season contrasts.

(10 marks)

1(b)
Level 3
Good appreciation of the nature of vegetation succession and its relationship to climate in the development of climax vegetation as expressed through TRF or Savannah woodland. Interruptions to succession through human or edaphic agencies will produce savannah grasslands or secondary TRF .
(15 –12)
L2
Some appreciation of succession although the account will be mainly descriptive. TRF will be related to climate (i.e. copious ppt and high temps) whilst Savannah will be seen as a product of a combination of lower and seasonal ppt and human activities to produce a plagio- climax.
(11-7)
L1
Little appreciation of succession and essentially descriptive accounts of TRF and Savannah. associations with either climate or human activities will be poorly developed. Not much credit can be given for TRF destruction unless related to vegetation succession in some way
(6 –0)

Q.2. (a)
Good candidates may well express the nutrient flows through a Gerscmel diagram thus demonstrating the relative size of the stores and flows . These should be explained in terms of climatic inputs and the outputs via leaching etc. (10 –8). A more descriptive approach will be to plough through the diagram explaining each of the terms , flows and stores shown. Some concept of nutrient cycling should be in place (7-5). A straightforward descriptive account of TRF as represented by the diagram should still include some suggestion of flows/transfers for passing marks .
(4 –0)

2(b)
L3
In both cases the significance of appropriate chemical weathering activity should be explained. In the case of granite this will be developed in terms of basal weathering surfaces at depth. Resultant landforms will be seen as a result of subsequent exposure and will be related to rock jointing etc. Limestone will be seen as developing in areas of small regolith where there is intense vertical solution leading to cockpit Karst, tower karst, mogotes etc
(15 – 12)
L2
Reasonable description of appropriate chemical weathering activities although in the case of granite these may be rather unspecific. An awareness of the influence of jointing etc, but a rather straightforward association of process and landform will be given. Descriptive approach.
(11-8)
L1
A rather jumbled and outline account of weathering with not much distinction between the relative significance of chemical and mechanical processes. The approach to landforms will be descriptive with only a weakly developed link to weathering processes. For pass marks , however, there should be some relevance to the tropics.
(7 –0)

Coastal Environments
3 (a)
Sea waves are generated by the drag effect of wind producing orbiting water particles. Height, length and velocity are all dependent upon wind speed, fetch and depth Constructive and destructive waves should be described as well as their effects in terms of sediment transport. Good answers will deal effectively with the processes (10 –8) whilst moderate ones will be descriptive (7 –5) . Passing answers will do little more than ascribe waves to wind strength and mention the effects of constructive and destructive waves (4-0)

3 (b)
L3
Good annotated diagrams or diagram could be employed to show the main feature of a spit including laterals etc. Processes in terms of LSD and coastal; configuration could also be shown. It is possible to include a salt marsh behind the spit and indicate the conditions and processes required for its development. There will be a realisation of the fragile nature of these environments and hence both the destructive and protective impact of human activities.(15-12)

L2.
Descriptive account of both spits and salt marshes accompanied by rather crude diagrams. Processes will be more limited in terms of explanation although there will be some awareness of LSD and sediment accumulation in tidal areas and the impact of vegetation. Human activities will I suspect be seen as largely destructive.
(11 –8)

L1
Outline description of features only. Probably salt marshes will be little understood and processes generally weak. Human activities will be limited to ephemeral features (e.g. recreation)
(7-0)

4. (a) Good answers will describe the nature of a sediment cell and deal with the various sources of sediment which is moved by longshore processes. The sinks will be seen as areas of deposition related both to nature of the material and the processes transporting it.(10 –8) . More descriptive answers will merely run through the diagram giving some information upon each element (7-5). Weaker answers will merely repeat the terminology of the diagram with precious little expansion or explanation. (4-0)

4(b)
L3
The question asks for management problems related to an example or a number of examples. Thus management problems will be developed in the context of particular environments such as the destruction of coral coasts, coastal protection or the needs for conservation. Solutions will be suggested and evaluated at this level.
(15 –12)
L2
A descriptive approach that tends to deal in generalities e.g. coastal erosion rather than specific issues relating to particular coastal areas. Even so , examples will be cited and some attempt made to look at solutions. Management as such is unlikely to be addressed.
(11-8)
L3
Seen as an opportunity to write in general terms about coastal protection schemes and methodologies with an emphasis, no doubt, upon hard engineering. Both location and evaluation will be vague at best.
(7-0)

Hazardous Environments

Q.5. (A) In good answers,the nature of rapid mass movements (landslides, rockfalls avalanches etc)should be described as well as some indication of their causes (tectonic, excessive rainfall, slope failure etc) .These are hazardous when proximate to settlements and particularly in dense urban settlement established on unstable slopes (shanties etc) (10- 8) Weaker answers will either concentrate entirely on one form or movement (e.g. avalanches) and will make little of the processes that bring about hazardous instability.

5(b)
L3

Good candidates will develop a case study or a comparative set of examples of the management of particular hazardous environments. These could feature the effectiveness of prediction (e.g. volcanoes hurricanes), precautionary activities buildings strengthened etc) or even retreat and evacuation plans. These activities can be compounded or even confounded by actual events.
(15 –11)
L2
Descriptive of actual hazardous environments often concentrating on a particular event. Effects will feature more then management but there will be some description of precautionary activities (buildings etc)
(11-8)
L3
Largely accounts of hazardous events such as earthquakes, volcanic eruptions concentrating on the disastrous effects. Little concept of planning or management will be apparent.
(7-0)

Q.6. (a) Good answers will use the diagram to demonstrate the general conditions (sea temperatures, tropics, coriolis force etc) required for hurricanes and how it produces the patterns of frequency and impact(open shelving coasts etc) (10 –8)
Other answers will either ignore the diagram and write about hurricanes in general or will merely repeat material from the diagram.

6.(b)
L3
Most will concentrate on earthquakes and to a lesser extent volcanoes, although there may be some realisation that landslides and tsunamis etc are also a potential hazards. These answers will be marked by a good description of causes and good exemplification of different types of hazard.
(15 –12)
L.2.
Descriptive account of the hazards concentrating on vulcanicity and earthquakes. The descriptions will be reasonably accurate and some examples quoted . The causal links with tectonic movements, however, will be less well developed and the accounts will be characterised by only limited explanation.
(11-8)
L1
Limited descriptions generally of either earthquakes and/or volcanoes. Little attempt will be made to explain causes and exemplification will be poor or lacking.
(7-0)

Arid and semi – arid environments

Q.7. (a) Surface water stores can exist in the form of playa lakes, oasis and exotic rivers (may be seasonal flows.) Groundwater can be fossil ground water stores developed in suitable aquifers. Most stores are short lived and consequent upon sudden inundations e.g. wadi flows, sub-surface stores in wadis or playas within internal drainage basins. Good answers will give reasonable coverage and

exemplification (10 –8) ,whilst weak answers will probably be limited to oasis and such rivers as the Nile.

(b) L3
Generally by their scarcity ! Answers at this level will address soils, vegetation and human activities. Soils by the drawing of salts etc to the surface and producing poorly consolidated and rather structureless soils. Vegetation through the various xerophytic adaptions, and human activities through nomadism or the clustering of activities at sites of water supply. Population levels are generally low as a consequence. Some may develop water harvesting, irrigation etc.
(15 –12)
L2
Not as well balanced account although some attention will be given to each category. Soils will be fairly basic in terms of effects as well as vegetation. Most attention will be focussed on human activities where there may well be extensive accounts of the effects of irrigation, the Aswan dam etc.
(11 – 8)
L1
Weak and descriptive accounts largely featuring one category – most likely is human activities. These will be rather generalised and unspecific and will be poorly related to water resources.
(7 – 0)

Q.8 (a)
Good candidates will observe the considerable amount of overlap between the two maps. Areas of high % rainfall variability extend beyond the arid areas although extremely arid areas are always contained within this zone. Aridity and ppt variability are coincident in continental interiors and some coastal locations. Explanation could be couched in terms of the conventional nature of rainfall and hence it's "spotty" distribution. Generally variability is greatest where rainfall totals are lowest. Good candidates will use the diagram (10 –8) whereas most will merely write about general climatic causes of aridity.

(b) L3
Erosional processes include water erosion via stream and sheet floods as well as wind erosion (deflation ,abrasion etc) It is the processes that should feature although many will develop these in the context of resultant landforms. Good candidates will argue that these processes do operate today, but on a limited scale that is unlikely to produce the landforms that are characteristic of hot deserts.
(15 –12)
L2
Descriptive of the processes which are largely couched in landform term i.e. desert piedmont, yardangs ,zeugans ,Quattara Depression etc. Even so there will be some understanding of the nature of the actual processes and how they might contribute to the formation of desert landforms. Present activity will be largely ignored in favour of past pluvial periods.
(12 – 8)
L1

A generalised account of desert landforms with only passing reference to the nature of the processes. No concept of scale or of impact. Present processes will be viewed solely as transportation (dunes) and material of dubious relevance relating to the evidence for a wetter past will be included.
(7 –0)