www.dynamicpapers.com

ENVIRONMENTAL MANAGEMENT

Paper 0680/12
Paper 1 Theory

Key messages

- Candidates should read questions carefully to ensure their responses provide appropriate detail.
- Answers should link to the command verbs within the question (describe, explain, etc.).
- The six mark, (level of response) question requires candidates to look at the topic broadly and use appropriate examples to support their views.
- Graphs should include labelled axes as well as using an appropriate linear scale.

General comments

The majority of candidates attempted all questions on the paper. This is a good strategy as it is still possible for weaker candidates to gain some credit for their responses even if their answers are incomplete.

Some questions also required the answer to be tailored to a specific context. This was sometimes not acknowledged within the answer provided; for example many failed to give geological reasons for not extracting minerals but gave environmental reasons instead.

Candidates should also use the number of marks allocated to a question as a guide to the number of points they should make in their responses. Command words such as ‘describe’ or ‘explain’ will also provide key information about the style of response required and the level of detail required to gain credit. There was evidence of appropriate and accurate use of scientific terminology within some scripts.

There was generally a good standard of mathematical work although not all candidates used rulers when completing graph work.

The responses to the 6-mark level of response question were well structured but centres are reminded that candidates should consider a range of points and support them with examples where relevant. In this example many statements did not have a supporting example. Candidates should also ensure that their response includes a clear conclusion.

Comments on specific questions

Section A

Question 1

(a) Many candidates answered this introductory question correctly and were able to apply their knowledge to the slightly different format presented.

(b) This was a more challenging question; relatively few responses correctly identified that fossils were the remains of living organisms. Many candidates did not respond to the question posed and only wrote about the formation of sedimentary rocks.

(c) Many responses neglected to refer to the geological reasons impacting on the decision to extract rocks and gave environmental reasons which were not given credit in this scenario.

(d) The majority of candidates were able to name another type of surface mining, although some did repeat the type given in the question.

© 2022

www.dynamicpapers.com

Question 2

(a) (i) Most candidates referred to the catching of a non-target species, often simply rephrasing this for their second reason. Relatively few responses identified that the quota may have already been reached.

(ii) Most candidates were confident in calculating the correct answer. The most common error was to omit the word 'billion'.

(b) This question proved challenging for a large number of candidates showing some confusion between the terms 'net type' and 'mesh size' which reflected in a lack of clarity within the answers provided.

Question 3

(a) This was a very accessible question with the majority of candidates able to rank the materials correctly.

(b) This was another subject area where the candidates showed confidence in their answers. Many cited the use of more efficient devices and switching off items when not in use. The third mark proved more challenging; many incorrectly suggested using renewable sources. This was not given credit as it did not reduce the energy consumption in the building. The use of better insulation (in colder climates) and better natural ventilation (in warmer climates) were both given credit.

Question 4

(a) Candidates were generally accurate in their description of the route of the cyclone. Many different methods for describing the route were credited including a measurement of the distance it travelled. Some lower-scoring candidates incorrectly transposed East and West or used descriptions such as 'top and bottom' which were not given credit.

(b) Many candidates were well prepared for this question and able to cite the conditions needed for a cyclone accurately and concisely. Others were too general in their approach or described the weather resulting from a cyclone.

(c) Generally answered well and with detail. Candidates were able to suggest valid reasons such as the level of preparation, the quality of construction and the density of the population.

Section B

Question 5

(a) (i) Most candidates produced a bar chart which clearly presented the data. There was generally a good choice of scale and an accurate plotting of the bars. The most common error was the lack of labelling of the axes. Whilst the majority of candidates used a ruler and pencil for completing their chart, some used pen which was potentially more challenging for the candidate to use if they made an error in their plotting which they wished to amend.

(ii) The majority of candidates were able to use the data to calculate the correct answer (98 per cent).

(iii) This question proved more challenging. Many responses gave reasons for the reduction in emissions over the time period rather than focusing on the rate of reduction as required within the question. Best responses gave reasons such as the major reductions had already occurred or that the current technology did not permit the rate of reduction to continue to be maintained.

(b) Candidates generally scored well on this question although some did not completely focus on car-based strategies.

© 2022

www.dynamicpapers.com

Question 6

(a) (i) Many responses made good use of the diagram to interpret the process of drip irrigation and provided valid reasons for the role of each part. The role of the filter in the removal of solids was the most common omission.

(ii) Responses to this question demonstrated that the benefits of trickle drip irrigation were generally widely known.

(b) A proportion of candidates did not read the question in sufficient detail and referred to irrigation techniques. Many different techniques were given credit although some responses did not adequately describe the way in which their technique created an increase in yield. Candidates need to be aware of and respond to the command verb within questions.

Question 7

(a) (i) Candidates were able to use the line graph to determine the countries with the greatest population density and where there had been the greatest increase.

(ii) Most candidates were able to complete the correct calculation using data from the graph. A range of answers were given credit to allow for minor differences in reading the axis.

(iii) Responses showed a wide range of suitable answers, often linked to migration or disease. References of a decrease in birth rate needed to be linked to death rate to be given credit. Not all responses confined themselves to the time between 1990 and 2016.

(b) This question allowed candidates to include a range of reasons for the phenomenon observed. Whilst there were a number of good responses, some did not direct their answer to address the benefits to the natural environment.

Question 8

(a) (i) There was a good understanding of the concept of the pyramid of numbers in an ecosystem which was demonstrated within the answers.

(ii) Many responses were able to state that energy was lost between trophic levels although it was typically only the higher-scoring candidates who also described how energy is lost.

(b) The concepts of bio-magnification and bio-accumulation were widely understood with some good explanations provided.

(c) (i) Candidates were generally accurate in calculating the average to complete the table of data.

(ii) There was good use of the data to identify the lowest concentration although a common error was to cite sample site F.

(iii) There were fewer errors in finding the site with the greatest concentration.

(iv) Some candidates found it challenging to give reasons to support the conclusion. Many correctly identified that these substances were present in every sample.

(d) As is common with this paper, the final item was a six mark level of response question. This allows a range of potential answers and allows the candidate to demonstrate their broader knowledge about the topic. Whilst the published mark scheme lists many potential ideas, it is not expected candidates will cover all of these, or indeed may introduce other relevant ideas or supporting examples. Best responses provided a balanced view about the role of international agreements and the difficulty in ensuring these agreements are complied with. Some responses identified the lack of resourcing available to LEDCs or the relative economic importance of the oceans to some nations.

© 2022

www.dynamicpapers.com

Lower-scoring candidates sometimes provided only a limited response; they often limited their answer to one issue such as oil pollution or fishing policy. There is evidence in some stronger scripts of good planning of responses prior to completing their final answer. This helps to provide a logical structure to the response to maximise the marks.

© 2022

www.dynamicpapers.com

ENVIRONMENTAL MANAGEMENT

Paper 0680/22
Paper 2 Management in Context

Key messages

Candidates should:

- Read the whole of each question carefully. Underlining the command words and words that indicate the context of the question can be a useful strategy.
- Remember that not all the answers are written on lines, check if answers have to be written in a table or on a diagram.
- In calculations and numerical answers check that numbers are written clearly and that the correct units are part of the answer.
- Use the mark allocations and answer space provided as a guide to the length of answer required and the number of points that need to be made.
- Write clearly and concisely.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Guinea. Many candidates understood and made good use of the source material and their written responses were sufficiently clearly expressed. The mathematical and graphical questions did pose some challenges for a minority of candidates.

Candidates had no problems completing the paper in the time available.

Overall, the pattern of this paper is very similar to past papers and Centres are advised to work through past papers to help candidates see how to make the best use of the information given for each question.

Comments on specific questions

Question 1

(a) (i) Most candidates correctly calculated the number of people in Guinea that are under the age of 25, giving the answer as 7.62 million or as 7 620 000. A minority of candidates gave an answer without the word ‘million.’

(ii) Most candidates suggested at least two reasons why 60 per cent of the population in Guinea is under the age of 25. Many used the information about the high population growth rate provided at the start of the questions. The stronger responses developed ideas related to the high birth rate. The implications of the low life expectancy were less well understood.

(iii) Many candidates suggested unemployment and the need to increase expenditure on education as impacts of a youthful age structure on a less economically developed country (LEDC). There were also references to a large population under 25 being a burden on the working population. Other impacts suggested were the need for more housing and more health services such as doctors and hospitals.

© 2022

www.dynamicpapers.com

(iv) The responses to this question, requiring a description of **three** pieces of evidence in the photograph that suggest Guinea is a less economically developed country (LEDC) were variable. The stronger responses showed a sound understanding of how the use of an animal for transport, the dirt road, the litter and the poorly constructed buildings were evidence. Weaker answers described things that were missing from the photograph that would be found in a more economically developed country (MEDC).

(b) (i) There were many detailed descriptions showing a sound understanding of the process of photosynthesis. Good use was made of the equations carbon dioxide + water → glucose + oxygen, or $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ with reference often made to the presence of light energy and chlorophyll. A minority of candidates reversed the equations.

(ii) Many responses displayed a good understanding of the process of pollination in self-pollinating flowers. A common error was to refer to insects.

(c) (i) Most responses suggested one benefit of exporting peanut oil instead of peanuts.

(ii) Most candidates gained some credit for suggesting two possible uses for the peanut waste after the peanut oil has been extracted. The most common uses gaining credit were fertiliser and food for livestock.

(iii) Most candidates suggested at least one correct reason why the government of Guinea encourages farmers to grow peanuts. The most common answers gaining credit were about employment on farms and in factories processing the peanuts, and the various types of revenue obtained that the government could use to spend on developing infrastructure. A common mistake was to suggest why the farmers grew peanuts.

(d) (i) Most responses correctly calculated the total annual rainfall as 1153 mm. A minority of candidates calculated the average monthly rainfall or added up the monthly temperatures.

(ii) Most candidates gained some credit for using the climate data to explain why farmers can grow peanuts. The strongest responses stated that the temperature was 24°C or above all year and the rainfall exceeded the 700 mm required. Some of the responses included calculations that the average monthly temperature in the region was 26.25°C and that there was plenty of rainfall, 453 mm more than the 700 mm needed.

(iii) Most candidates suggested that peanut plants in this region grow more slowly in January than in any other month because there is no rainfall. Common errors were to state that the temperature was always above 24°C or there was low rainfall. Some candidates made only one suggestion. The question has an allocation of two marks so two suggestions or ideas were needed for full credit.

(iv) This question also has an allocation of two marks, so the explanation needed at least two ideas. Most candidates gained credit for explaining that August has the highest rainfall. They needed to develop this answer with examples of the erosion caused by the high rainfall. The stronger responses gave detail about the soil becoming waterlogged, flooding or surface runoff washing soil away.

(e) (i) The stronger responses explained that the farmers expect the yield of peanuts to go down after several years because the peanuts use the same minerals to grow, and this causes the soil to become infertile. Some responses showed good understanding of the increase in diseases and pests caused by monoculture and the need for crop rotation to restore nutrients.

(ii) Many responses displayed a good understanding that using the stems and leaves of the peanut plants to feed livestock was sustainable because it meant that there was no waste and the animals' manure could be used as fertiliser. Some went on to describe how the animals would require less food from other sources and could provide meat or dairy products that could be eaten by the farmer or sold. Weaker responses simply stated that because the stems and leaves were fed to livestock this was sustainable.

(iii) Most candidates suggested at least one other way farmers without livestock can make their farming sustainable. The most common ways mentioned were using organic fertiliser such as peanut waste, crop rotation, trickle drip irrigation and rainwater harvesting.

© 2022

www.dynamicpapers.com

Question 2

(a) (i) The stronger responses showed a sound understanding of how the pooter shown in the diagram is used to collect insects. Many of these responses supported their descriptions with labels on the diagram. The most common error was stating that the purpose of the covering over the end of the tube on the left was to supply the insect with air.

(ii) Many candidates had difficulty describing a method the student can use to select the peanut plants at random from each field. There was confusion about how the plants can be selected with many describing systematic sampling and the use of quadrats. Some responses stated that a 'random selection' would be made, or plants would be selected 'randomly' without giving descriptive details of a suitable method. Relatively few candidates achieved full credit on this question. Those that did often started their response with a description of dividing the field into plots to form a grid, and then using pairs of random numbers to provide locations to select plants. These candidates went on to describe how the random numbers would be generated. Ways credited for making a random selection included drawing chits from a bag, rolling dice, using random number tables or a random number generator in a computer programme.

(iii) Most candidates correctly stated the highest number of insects collected from one plant for each field. A minority of candidates incorrectly gave the number of the plant where the highest number of insects were found. A few candidates misread the question and gave the number of insects on plant number 1 for each field.

(iv) Most candidates plotted the data correctly as a bar chart that fitted on the grid. Common errors were omitting the labelling of the axes or missing out the word 'average'. Some candidates did not read the question carefully and plotted the insects on the plants instead of in the fields or the total number of insects instead of the average.

(b) Nearly all candidates gained partial credit for discussing whether the results of the student's two investigations support what the farmer thinks. The most successful responses referred to the results on the leaves and in the soil. Some responses only mentioned the soil or the pitfall trap. Others were vague answers that did not mention the leaves, the soil, the pitfall trap or the pooter.

(c) (i) Many candidates successfully completed the table to name three types of soil particle in order of size. Some thought clay was the largest soil particle and sand the smallest. Others included loam instead of silt.

(ii) Many candidates correctly named two other mineral ions that are present in a fertile soil as potassium and nitrate. Some included phosphate when the question asked for only two other mineral ions.

(iii) Most candidates stated at least one other correct component of soil.

(d) Nearly all candidates gained full credit for stating one other strategy for reducing soil erosion. The most common strategies mentioned were terracing, contour ploughing, windbreaks and planting trees.

Question 3

(a) (i) Most candidates gained partial credit for suggesting two benefits of making the building blocks hollow. The most common benefits suggested were that hollow blocks needed less wet earth, dried more quickly and were lighter.

(ii) Many candidates successfully suggested at least one advantage of making the building blocks by machine. The most common advantage suggested was that machines made the blocks more quickly. Some responses included two advantages that were the same. For example 'faster', 'quicker', 'saves time', 'more blocks made'.

(b) (i) This question proved challenging for many candidates. A significant number appeared to confuse ozone depletion and the enhanced greenhouse effect. Higher-scoring candidates began their responses by stating that carbon dioxide is a greenhouse gas. They went on to describe how increased amounts of carbon dioxide trap radiation causing the temperature in the atmosphere to

© 2022

www.dynamicpapers.com

increase, which causes temperatures on the Earth to increase. Many candidates only gained credit for knowing that carbon dioxide caused the temperature of the Earth to increase.

(ii) Most candidates correctly named one gas, other than carbon dioxide, that contributes to the enhanced greenhouse effect.

(c) (i) Many responses gained partial credit for suggesting two other ways the government of Guinea can limit the use of cement. Some candidates who suggested using alternatives to cement needed to state an example to gain credit.

(ii) The most suggested disadvantage of using wood for building was deforestation. Other correct disadvantages were that wood can be eaten by termites, can be a fire risk and can rot.

Question 4

(a) (i) The stronger responses focused on the dangers of working in a shaft mine, mentioning tunnels collapsing, flooding, explosions and lack of oxygen. Weaker responses did not answer the question as they made general statements about more accidents and deaths occurring in shaft mines. These weaker responses often stated that open-pit mines were surface mines and shaft mines were sub-surface.

(ii) Many responses suggested that local people want diamond mining to continue in the area because it meant there were jobs available, and that the infrastructure would be improved. Suggestions about local people selling diamonds and tourism were not given credit.

(iii) Many responses displayed a good understanding of the role of an environmental impact assessment. These responses explained how mining could cause a lot of damage and the mining company would have to restore the environment when the mining finished. There were appropriate references to local people, pollution, waste and wildlife.

(iv) The responses to this question, requiring a description of ways the landscape shown in the photograph can be restored after all the mining is finished, were variable. The stronger responses showed a sound understanding of how, after the hole on the surface is filled in with overburden, topsoil is spread back over the surface and fertilisers are added. It would then be landscaped with grass, plants and trees. Some candidates included references to bioremediation. Others described how the mine could become a lake or reservoir for recreational activities. Weaker answers simply listed possible uses for the site without mentioning the process of restoration.

(b) There were many excellent responses that described strategies for the sustainable use of rocks and minerals. These included increased efficiency in the extraction and use, recycling and re-use, using alternatives, laws and quotas. Some candidates misread the question and wrote at length about the different uses of rocks and minerals.

© 2022