



Advanced Subsidiary GCE

GENERAL STUDIES

Unit F732: The Scientific Domain

Specimen Paper

Additional Materials: Answer Booklet (8 pages)

F732QP

Morning/Afternoon

Time: 1 hour



INSTRUCTIONS TO CANDIDATES

- Write your name, Centre number and candidate number in the spaces provided on the answer booklet.
- Write your answers in the answer booklet.
- If you use additional sheets of paper, fasten the sheets to the answer booklet.
- Answer **all** the questions in Section A and **one** question in Section B as indicated.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part of question.
- The total number of marks for this paper is **60**.
- You are advised to divide your time equally between Sections A and B.
- **Where an answer requires a piece of extended writing, the quality of your written communication will be assessed, including clarity of expression, structure of arguments, presentation of ideas, spelling, punctuation and grammar.**
- You may use an approved calculator.

ADVICE TO CANDIDATES

- Read each question carefully and make sure you know what you have to do before starting your answer.

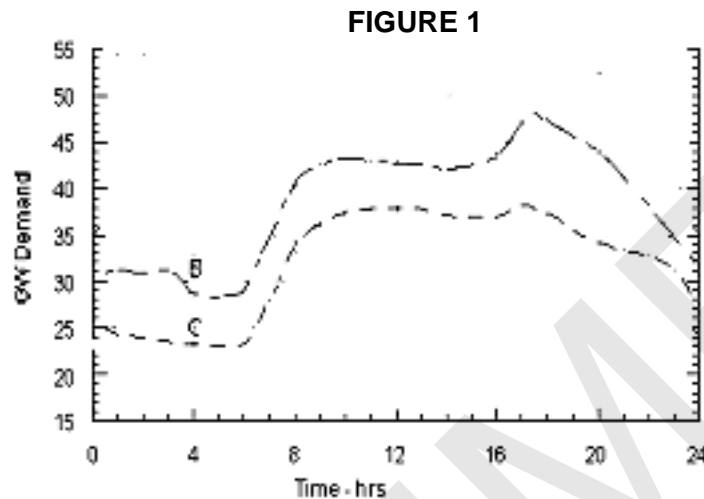
This document consists of **4** printed pages.

Unit F732: Scientific Domain

Section A

Answer **all** questions in this section.

- 1 **Figure 1** shows the daily load that electricity demand places on the England and Wales power supply system.



Curve B typical winter demand, 2000

Curve C typical summer demand, 2000

- (a) Describe and account for the daily pattern of electricity demand displayed in **Figure 1**. [6]
- (b) Describe **two** ways in which the graph in **Figure 1** has been designed to convey a particular message. [6]
- 2
- (a) The number 28 is said to be a perfect number because its factors (1, 2, 4, 7 and 14) add up to 28. Demonstrate that only **one** number below 10 is a perfect number. Show how you reached your answer. [3]
- (b) Tourists from the UK travelling in France pay for goods in euros (€). If £1 = €1.45, calculate the cost, in UK currency, of a pair of training shoes for sale in a market in France at €10. [3]
- 3 Describe how you would design and carry out an investigation into the suggestion that the height and weight of individuals are linked. [12]

Section A Total [30]

3

Section B

Answer **one** question from this section.

Answers must be in continuous prose.

- 4 Why are some governments attempting to reduce rates of population growth in their country whilst others are trying to increase theirs? [30]
- 5 Space exploration is expensive. For example, the USA mission to land on Mars is estimated to cost £350 billion. In comparison, financing sustainable agriculture in the poorest countries might cost £120 billion over 10 years. Assess the advantages and disadvantages of continued expenditure on space exploration and space technology. [30]
- 6 A park warden studying the problems caused by visitors to a country park might list all the reports of damage. The park warden could then group the reports into different categories.

The reports of damage could be grouped in a number of ways including:

- the time of the year when the damage took place
- the location of the damage
- the extent of the damage.

How might grouping the different categories of damage help the park warden to understand its causes and make recommendations to the country park committee?

In making recommendations should the warden give priority to visitors or the people who live in the country park? [30]

Section B Total [30]

Paper Total [60]

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The maximum mark for this paper is **60**.

Generic Mark Scheme for questions worth 30 marks

AO1	Level descriptor The candidate demonstrates the following abilities where appropriate to:	Marks
Level 1	<ul style="list-style-type: none"> select, use and integrate a very good range of relevant knowledge show a good understanding of the concepts involved 	8
Level 2	<ul style="list-style-type: none"> select, use and integrate a good range of relevant knowledge show an understanding of the concepts involved 	6-7
Level 3	<ul style="list-style-type: none"> select, use and integrate a range of relevant knowledge show an adequate understanding of the concepts involved 	4-5
Level 4	<ul style="list-style-type: none"> select, use and integrate a limited range of relevant knowledge show a modest understanding of the concepts involved 	2-3
Level 5	<ul style="list-style-type: none"> select, use and integrate some knowledge which may not be accurate show a restricted understanding of the concepts involved. 	1
AO2	Level descriptor The candidate demonstrates the following abilities where appropriate to:	
Level 1	<ul style="list-style-type: none"> interpret and analyse issues and problems well and evaluate them appropriately use evidence to develop complex reasoned arguments and draw sound conclusions on the evidence 	9-10
Level 2	<ul style="list-style-type: none"> interpret and analyse issues and problems and evaluate them competently use evidence to develop reasoned arguments and draw conclusions on the evidence 	7-8
Level 3	<ul style="list-style-type: none"> undertake some interpretation and analysis of issues and problems and make a superficial evaluation use evidence to develop arguments and draw conclusions 	5-6
Level 4	<ul style="list-style-type: none"> demonstrate limited interpretation and analysis of issues and problems with limited evaluation use evidence to develop limited arguments and draw limited conclusions 	3-4
Level 5	<ul style="list-style-type: none"> demonstrate poor interpretation and analysis of issues, problems and evaluation recognise arguments and conclusion. 	1-2

A03	<p style="text-align: center;">Level descriptor The candidate demonstrates the following abilities where appropriate to:</p>	Marks
Level 1	<ul style="list-style-type: none"> • demonstrate very good awareness of the differences between types of knowledge • have a very good appreciation of the strengths and limitations of the different types of knowledge 	6
Level 2	<ul style="list-style-type: none"> • demonstrate good awareness of the differences between types of knowledge • have a good appreciation of the strengths and limitations of the different types of knowledge 	5
Level 3	<ul style="list-style-type: none"> • demonstrate awareness of the differences between types of knowledge • have an appreciation of the strengths and limitations of the different types of knowledge 	4
Level 4	<ul style="list-style-type: none"> • demonstrate limited awareness of the differences between types of knowledge • have a restricted appreciation of the strengths and limitations of the different types of knowledge 	3
Level 5	<ul style="list-style-type: none"> • demonstrate very limited awareness of the differences between types of knowledge • have a very restricted appreciation of the strengths and limitations of the different types of knowledge. 	1-2
A04	<p style="text-align: center;">Level descriptor The candidate demonstrates the following abilities where appropriate to:</p>	
Level 1	<ul style="list-style-type: none"> • communicate complex ideas clearly and accurately, using specialist vocabulary where appropriate, in a concise, logical and relevant way • use a wide range of the rules of grammar, punctuation and spelling with accuracy and facility 	6
Level 2	<ul style="list-style-type: none"> • communicate ideas clearly and accurately, using specialist vocabulary where appropriate, in a concise, logical and relevant way • use a range of the rules of grammar, punctuation and spelling with facility 	5
Level 3	<ul style="list-style-type: none"> • communicate clearly, using some specialist vocabulary with facility • use some of the rules of grammar, punctuation and spelling with facility 	4
Level 4	<ul style="list-style-type: none"> • communicate ideas with limited clarity, using some specialist vocabulary • use some rules of grammar, punctuation and spelling 	3
Level 5	<ul style="list-style-type: none"> • communicate with little clarity using occasional specialist terms • use poor grammar and punctuation, and inaccurate spelling. 	1-2

Section A		
Question Number	Answer	Marks
1	<p>Figure 1 shows the daily load that electricity demand places on the England and Wales power supply system.</p> <p style="text-align: center;">FIGURE 1</p> <p style="text-align: center;">Curve B typical winter demand, 2000 Curve C typical summer demand, 2000</p>	
(a)	<p>Describe and account for the daily pattern of electricity demand displayed in <u>Figure 1</u>.</p> <p>1 mark for each descriptive point (max 2) including:</p> <ul style="list-style-type: none"> • cyclical • winter demand higher than summer • night demand lower than day • rapid rise each morning • evening rise. <p>1 mark for each explanatory point (max 2) including:</p> <ul style="list-style-type: none"> • rhythm of the day • winter heating demand • fewer users at night • morning heating and cooking • evening return home for main meal and entertainment. <p>Max 2 marks for clarity of response.</p>	[6]

Section A		
Question Number	Answer	Marks
1(b)	<p>Describe two ways in which the graph in Figure 1 has been designed to convey a particular message.</p> <p>Fig 1 has the following design features</p> <ul style="list-style-type: none"> • vertical axis does not start at zero • GW demand not defined • GW units not clear • typical not defined • no title on graph. <p>Max 2 marks for each of the two examples: – the way the graph is designed (accept example or drawing) (1) – explanation of how result is achieved (1)</p> <p>Max 2 marks for clarity of response.</p>	[6]
2(a)	<p>The number 28 is said to be a perfect number because its factors (1, 2, 4, 7 and 14) add up to 28. Demonstrate that only <u>one</u> number below 10 is a perfect number. Show how you reached your answer.</p> <p>The correct answer is 6 (1) Demonstration that 6 is 'perfect' i.e. $3+2+1$ (1) Evidence of search for 'perfect' numbers below 10 (1)</p>	[3]
2(b)	<p>Tourists from the UK travelling in France pay for goods in euros (€). If £1 = €1.45, calculate the cost, in UK currency, of a pair of training shoes for sale in a market in France at €10.</p> <p>£6.90 units required (3) £6.89 [incorrect rounding] (2) €10 divided by 1.45 (1 only) [method of working lacks clarity/no indication of units/incorrect answer]</p>	[3]

Section A		
Question Number	Answer	Marks
3	<p>Describe how you would design and carry out an investigation into the suggestion that the height and weight of individuals are linked.</p> <p>Candidates need to:</p> <ul style="list-style-type: none"> • establish a strategy for the investigation • collect and record information • analyse information • draw conclusion(s). <p><i>Clearly some of these categories will overlap or be out of time sequence.</i></p> <p>Establishing a strategy These are things to think about and plan before the practical activity starts including:</p> <ul style="list-style-type: none"> • origin of the suggestion • other literature related to this suggestion • resources available • timing of investigation • definitions of height and weight • audience for conclusions. <p>Collection of information includes:</p> <ul style="list-style-type: none"> • location of sample people • size of sample • units of measurement • equipment needed • method of recording. <p>Analysing the information includes:</p> <ul style="list-style-type: none"> • arrangement and presentation of raw data • calculation of ratios or correlation analysis • graphs and line of best fit • analysis of sub groups e.g. male/female, different age groups. <p>Drawing conclusions includes:</p> <ul style="list-style-type: none"> • confirmation of analysis • trends discovered • evaluation of activity • limitations of findings. <p>Max 10 marks:</p> <ul style="list-style-type: none"> • Discussion of strategy (2) • Practical activities (6) • Conclusion(s)/evaluation (2) <p>Max 2 marks for clarity of response.</p>	[12]
Section A Total		[30]

Section B		
Question Number	Answer	Marks
4	<p>Why are some governments attempting to reduce rates of population growth in their country whilst others are trying to increase theirs?</p> <p>The question is in two parts:</p> <ul style="list-style-type: none"> • reasons for some governments attempting to reduce their population growth • reasons for some governments attempting to increase their population growth • some candidates may refer to the paradox suggested by the question and suitable credit should be given. <p>Reasons for increasing rate of population growth include:</p> <ul style="list-style-type: none"> • falling population totals threaten size of domestic market • size of workforce may be falling • greater dependency as number of older people increases • threat of loss of national identity as in migration needed • size of tax paying population falling • greater political impact on world stage • underpopulation and inability to develop potential resources. <p>Reasons for decreasing rate of population growth include:</p> <ul style="list-style-type: none"> • problems of food availability and hunger • health and education service overwhelmed • increased pressure on urban areas from rural to urban migration • shortage of housing and overcrowding • development threatened as funds diverted to crisis areas • rising prices e.g. housing, land etc. 	

Section B		
Question Number	Answer	Marks
4 cont'd	<p>Be ready to give some credit to candidates who explain why these problems have developed such as:</p> <ul style="list-style-type: none"> • high birth rates, falling death rates, longer life expectancy • religious and social conventions • low birth rates, low death rates, high standards of living, available birth control. <p>Credit examples:</p> <ul style="list-style-type: none"> • increasing strategies in Singapore, France, Italy and Sweden • decreasing strategies in China, India and many less economically developed countries. <p>Examiners should credit any other appropriate and relevant points raised by candidates.</p> <p>Exemplification of candidate performance at levels 1, 3 and 4. The exemplification is provided to give a general indication of the standards of achievement likely to have been shown by the candidates awarded the particular levels. The level awarded will depend in practice upon the extent to which the candidate has met the assessment objectives overall.</p> <p>Level 1 These candidates will offer at least two developed reasons for countries to increase their rate of population growth and two developed reasons for reduction (AO1 and AO2). Answers will imply recognition of the idea that context conditions these policies (AO3). Their answers will be written clearly with accurate spelling, punctuation and grammar and sound structure (AO4).</p> <p>Level 3 These candidates will include at least one reason for increase and one for decrease and one of them will be developed (AO1 and AO2). Answers will imply that context influences policies (AO3). The response will be clear but contain some errors of spelling, punctuation and grammar and modest structure (AO4).</p> <p>Level 4 These candidates will include at least one reason for increase and one for decrease (AO1 and AO2). Will assume context influences policies (AO3). Their command of AO4 will be limited and inaccurate.</p> <p><i>Recommended annotation:</i> <i>Intro for introduction</i> <i>I1, I2 and I3 for reasons for increase strategies</i> <i>R1 ,R2 and R3 for reasons for decrease strategies</i> <i>e.g. for examples of named countries</i> <i>B+ for background information of growing population</i> <i>B- for background information on declining population</i> <i>dev for development of points</i> <i>Conc for conclusion</i></p>	<p>25-30</p> <p>13-18</p> <p>7-12</p> <p>[30]</p>

Section B		
Question Number	Answer	Marks
5	<p>Space exploration is expensive. For example, the USA mission to land on Mars is estimated to cost £350 billion. In comparison financing sustainable agriculture in the poorest countries might cost £120 billion over 10 years.</p> <p>Assess the advantages and disadvantages of continued expenditure on space exploration and space technology.</p> <p>The question has three parts:</p> <ul style="list-style-type: none"> • recognition of the advantages of continuing • recognition of the disadvantages of continuing • some assessment of the balance between the two. <p>Advantages include:</p> <ul style="list-style-type: none"> • possible solutions to earth based problems e.g. resources • answers question about space • search for new life forms • advances scientific knowledge • develops technology for use on earth e.g. rocketry, satellites, communications systems, defence • provides employment • increases national status • supplies intellectual stimulus/human instinct for exploration. <p>Disadvantages include:</p> <ul style="list-style-type: none"> • finance could be used for earth based problems such as famine relief, disease control, medical developments, housing • space pollution • outcomes used for negative ends such as war, weapons and spying • research expertise could be put to better use on earth based projects • still plenty of problems to solve on earth. <p>Examiners should credit any other appropriate and relevant points raised by candidates.</p> <p>Exemplification of candidate performance at levels 1, 3 and 4.</p> <p>The exemplification is provided to give a general indication of the standards of achievement likely to have been shown by the candidates awarded the particular levels. The level awarded will depend in practice upon the extent to which the candidate has met the assessment objectives overall.</p> <p>Level 1 These candidates will present at least two developed advantages of continued exploration and two developed disadvantages (AO1). Crucially there will be some element of assessment (AO2). Answers will imply recognition of the idea that values condition outcomes (AO3). Their answers will be written clearly with accurate spelling, punctuation and grammar and sound structure (AO4).</p>	25-30

Section B		
Question Number	Answer	Marks
5 cont'd	<p>Level 3 These candidates will include at least one advantage and one disadvantage and one of them will be developed (AO1 and AO2). Answers will imply that values condition outcomes (AO3). The response will be clear but contain some errors of spelling, punctuation and grammar and modest structure (AO4).</p>	13-18
	<p>Level 4 These candidates will include at least one advantage and one disadvantage (AO1 and AO2). Answers will assume that values influence outcomes (AO3). Their command of AO4 will be limited and inaccurate.</p> <p><i>Recommended annotation</i> <i>Intro for introduction</i> <i>A1, A2 and A3 for advantages</i> <i>D1, D2 and D3 for disadvantages</i> <i>dev for development of points</i> <i>eg for examples</i> <i>Ass for points related to assessment of the two cases</i> <i>Conc for conclusion</i></p>	7-12
6	<p>A park warden studying the problems caused by visitors to a country park might list all the reports of damage. The park warden could then group the reports into different categories.</p> <p>The reports of damage could be grouped in a number of ways including:</p> <ul style="list-style-type: none"> • the time of the year when the damage took place • the location of the damage • the extent of the damage. <p>How might grouping the different categories of damage help the park warden to understand its causes and make recommendations to the country park committee?</p> <p>In making recommendations should the warden give priority to visitors or the people who live in the country park.?</p> <p>How does grouping help?</p> <ul style="list-style-type: none"> • brings together similar events • reveals patterns not seen by raw data • isolates unusual events • suggests coherence of like events • indicates influential factors. 	[30]

Section B		
Question Number	Answer	Marks
6 cont'd	<p>The question is in three parts:</p> <ul style="list-style-type: none"> arguments in favour of countryside being for visitors arguments in favour of countryside being for the people who live there assessment of the two cases. <p>Indicative content</p> <p>Arguments in favour of visitors include:</p> <ul style="list-style-type: none"> urban life demands green relief shorter working week gives time for leisure <ul style="list-style-type: none"> (b) countryside no longer essential for food (c) countryside sustained by taxes paid by urban areas (d) rural dwellers use towns <p>Arguments in favour of residents include:</p> <ul style="list-style-type: none"> countryside is farmer's place of work rich have always purchased space in the countryside needs protection from second home buyers attractions deteriorate if not sustained people born there have rights to live there in peace too many visitors destroy attractions. <p>Exemplification of candidate performance at levels 1, 3 and 4. The exemplification is provided to give a general indication of the standards of achievement likely to have been shown by the candidates awarded the particular levels. The level awarded will depend in practice upon the extent to which the candidate has met the assessment objectives overall.</p> <p>Level 1 answers will have a developed understanding of the role of grouping in problem solving. (AO1/AO2). They will be able to assess the alternative priorities of visitors and residents based upon evidence (AO3). Their answers will be clear and written with facility (AO4).</p> <p>Level 3 answers will show some understanding of the value of grouping but they are more likely to concentrate on the discussion of the relative importance of visitors and residents. As a result there will be some imbalance (AO1/AO2). Answers will imply that groupings chosen influence outcomes and that priorities are based upon the evidence.(AO3). The response will be clear but contain some errors of spelling, punctuation and grammar and modest structure (AO4).</p> <p>Level 4 answers will tend to show limited understanding of one of the two parts of the question (AO1/AO2). Answers will assume that the groupings chosen influence outcomes and the priority stated will be insecure (AO3). Their command of AO4 will be limited and inaccurate.</p>	<p>25-30</p> <p>13-18</p> <p>7-12</p>

Section B		
Question Number	Answer	Marks
6 cont'd	<i>Recommended annotation</i> <i>Intro for introduction</i> <i>G1, G2 for points about grouping</i> <i>V1, V2 .. for points in favour of visitors</i> <i>R1, R2.. for points I favour of residents</i> <i>Link for links to the country park context</i> <i>eg for examples</i> <i>Conc for conclusion</i>	[30]
Section B Total		[30]
Paper Total		[60]

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Assessment Objectives Grid (includes QWC)

Question	AO1	AO2	AO3	AO4	Total
1(a)	2	2	0	2	6
1(b)	2	2	0	2	6
2(a)	3	0	0	0	3
2(b)	3	0	0	0	3
3	6	4	0	2	12
4/5/6	8	10	6	6	30
Totals	24	18	6	12	60