DIRECTIONS TO CANDIDATES

The time allowed for this paper is 1 hour 45 minutes.

The paper is scored out of 50 marks.

The paper contains 13 units and 22 questions that are to be answered in the lined sections of this paper.

You must make a serious attempt and answer more than half of the questions.

This test booklet is to be handed in at the end of the test.

The written answers may range from a word, to a phrase, to a sentence or a number of sentences, or to a diagram or calculation. The space provided for answers gives an indication of the length of the response expected. The marks for each question are indicated in a bracket.

WHAT WILL BE ASSESSED IN THESE SHORT RESPONSE QUESTIONS

Although the answers are written, this is not a test of your writing ability. It is a test of your reasoning and thinking, and your ability to explain and justify your views. You should write clearly and legibly so as to communicate your understanding as well as possible, but your spelling and punctuation will not be assessed in this paper.

The written response questions aim to test your ability to produce, explain and justify ideas.

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD.
Questions 1 – 3

A map and graphs of average monthly temperature and rainfall for five cities are shown below.

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**Question 1**

Which of the five cities on the map has the highest rainfall?  

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**Question 2**

Is the claim that ‘increasing height above sea level is associated with less temperature variation between the seasons’ supported by the information? Justify your answer.
Question 3

Malaria is a disease that is spread by mosquitoes. The ideal breeding climate for mosquitoes is 25 to 27 degrees Celsius. Malaria-carrying mosquitoes breed best in humid environments.

In which one of the cities is malaria most likely?  

(1)
UNIT 2

Question 4
The images on the opposite page are of the Nobel Prize winning scientist Albert Einstein who developed the famous formula E=mc².

Compare and contrast the two images.

What impression does each give of Albert Einstein?

Your responses will be judged on the:

• accuracy of the description and understanding of the material;
• substance and quality of the interpretation offered. (3)
Questions 5 and 6
In a study into the effect of portion size on consumption, participants were encouraged to eat as much as they liked at a soup-only lunch. Unknown to them, half of those taking part ate from bowls that were refilled slowly through a tube in the base as the person ate.
After the meal the total volume of soup each person ate was measured. As well, each participant was asked to estimate how much soup they ate and to complete a questionnaire.
The study’s results are presented in the graph and the table below.

<table>
<thead>
<tr>
<th>Questionnaire items</th>
<th>Participants’ responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal bowl</td>
</tr>
<tr>
<td>1 How hungry are you right now? (0: very hungry; 9: not hungry)</td>
<td>7.7</td>
</tr>
<tr>
<td>2 Do you always try to eat all the food in your bowl?</td>
<td>61% yes</td>
</tr>
</tbody>
</table>

Question 5
What was the study designed to investigate?
Question 6
What do the results of the study demonstrate and what do they suggest? (3)

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UNIT 4

Question 7
What impressions are we given by the drawing below? And what is suggested by the drawing?

Your responses will be judged on the:

- accuracy of the description and understanding of the material; and
- substance and quality of the interpretation offered.
UNIT 5

Questions 8-10

Figure 1 shows the control system and the water flow system for a combined solar and gas water heating system for a swimming pool.

Electricity and gas are always available to operate the various parts of the system, but the solar pump is also controlled by a solar cell that only allows the pump to operate when there is sunlight.

The desired pool water temperature is currently set at 22 °C.

- Electricity is only required to operate the equipment and not for heating purposes.
- The pool pump takes water from the pool, through the filter, and then through the gas heater.
- When it operates, the solar pump takes water to the roof pipes where the water is heated by the sun, and then the heated water returns to the pool through the gas heater. If water coming from the roof is less than the desired pool water temperature (22 °C in this case), the solar pump turns off.
- Water always passes through the gas heater whether it is heating or not.
- Water temperature sensors are located in the pool and in the roof pipes.
- If the conditions are suitable for the solar pump to operate, it will always do so in preference to the gas heater.

![Diagram of control system and water flow system](image)

Figure 1

Question 8

What should happen when the pool water temperature reaches 22 °C? (1)

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..........................................................................................................................................................
..................................................................................................................................................... (1)
Question 9
Describe the conditions under which the solar and gas heating units would heat the pool water. (2)

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Question 10
On one sunny day with an air temperature of 22 ºC, the pool water temperature unexpectedly rises from the desired 22 ºC to 30 ºC.
The electricity and gas supplies are available and are turned on. (2)
Give a detailed explanation of what could have caused this situation.

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UNIT 6

Question 11
Table 1 shows the circulation (number of papers sold) and readership figures (estimated number of readers) for three Saturday newspapers.

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>2003</th>
<th>% change 1993 to 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paper A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td>263 000</td>
<td>281 000</td>
<td>6.8%</td>
</tr>
<tr>
<td>Readership</td>
<td>738 000</td>
<td>752 000</td>
<td>1.9%</td>
</tr>
<tr>
<td><strong>Paper B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td>394 000</td>
<td>391 000</td>
<td>−0.8%</td>
</tr>
<tr>
<td>Readership</td>
<td>1 351 000</td>
<td>1 331 000</td>
<td>−1.5%</td>
</tr>
<tr>
<td><strong>Paper C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td>381 000</td>
<td>398 000</td>
<td>4.5%</td>
</tr>
<tr>
<td>Readership</td>
<td>974 000</td>
<td>941 000</td>
<td>−3.4%</td>
</tr>
</tbody>
</table>

On the basis of the figures above, how might each paper argue that it is a sound and viable business?

**Paper A:**

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UNIT 7

Question 12
Compare the paintings on the opposite page.
What impressions are we given by each painting?
How does the Brack painting contrast with the Manet painting?

Your responses will be judged on the:
• accuracy of the description and understanding of the material; and
• substance and quality of the interpretation offered. (4)
A bar at the Folies-Bergère painted by Edouard Manet in Paris in 1891.

Barmaid painted by John Brack in Melbourne in 1952.
UNIT 8

Question 13
The following diagram and table are from a computer-based thesaurus and dictionary that defines and displays the meanings of words.

Explain what the definitions and the diagram show about the word ‘awful’. (3)
UNIT 9

Questions 14 and 15
A plantation timber company must decide which of three tree species (X, Y and Z) to plant.
Regardless of which species is planted, the trees are thinned (reduced in number by a fixed percentage) after 10 years and 20 years, and the wood is sold for woodchips. At 30 years, the trees are sufficiently mature to be used as construction timber but may be worth more if grown for a longer time.

For each of the three species the table below gives the cost of planting and annual maintenance, as well as the value of trees removed by thinning and when cut down at different ages.

- Profit = income derived from sale of wood – (cost of planting + maintenance cost)

<table>
<thead>
<tr>
<th>Cost/Income ($ per hectare x 1000)</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of planting</td>
<td>120</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Annual cost of plantation maintenance</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Income from trees removed by thinning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(wood used for woodchips)</td>
<td>At 10 years</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>At 20 years</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Income from trees cut down at different</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ages (wood used as construction timber)</td>
<td>At 30 years</td>
<td>360</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>At 40 years</td>
<td>510</td>
<td>470</td>
</tr>
<tr>
<td></td>
<td>At 50 years</td>
<td>830</td>
<td>1180</td>
</tr>
<tr>
<td></td>
<td>At 60 years</td>
<td>1310</td>
<td>1260</td>
</tr>
<tr>
<td></td>
<td>At 70 years</td>
<td>1040</td>
<td>1360</td>
</tr>
<tr>
<td></td>
<td>At 80 years</td>
<td>810</td>
<td>1240</td>
</tr>
<tr>
<td></td>
<td>At 90 years</td>
<td>670</td>
<td>980</td>
</tr>
</tbody>
</table>

Question 14
For each species of tree, in which year is the value of the wood at its maximum? (1)

<table>
<thead>
<tr>
<th>Species</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>Y</td>
<td>?</td>
</tr>
<tr>
<td>Z</td>
<td>?</td>
</tr>
</tbody>
</table>
Question 15
The company wants to maximise its profits over 90 years.
Which one of the following two strategies would better enable it to achieve its goal? Show your reasoning. (3)

**Strategy I**
Plant species Z, cut the trees after 90 years

**Strategy II**
Plant species Y, cut the trees after 50 years, then replant with species X and cut these after 40 years
Questions 16 and 17

In a study of elephants in captivity, a herd of ten elephants living in a zoo was observed over several months to determine factors influencing group structure and interactions.

The chart shows, for the elephants in the group, their family relationships, gender and age (whether juvenile or adult).

The figure below summarises observations of play behaviour within the group. The arrows indicate who initiated play and at whom the behaviour was directed. The numbers on the arrows give the number of approaches made by that individual. Assume that all approaches resulted in play.
**Question 16**
With whom did Tunga play most often? (1)

**Question 17**
To what extent do gender, family relationships and age influence play activity?
Use the information provided to justify your answer. (3)
UNIT 11

Questions 18 and 19

In the following passage a writer describes his relationship with the English football team, Arsenal.

One thing I know for sure about being a fan is this, it is not a vicarious pleasure despite all appearances to the contrary. And those who say that they would rather do than watch, are missing the point. Football is a context where watching becomes doing. When there is some kind of triumph, the pleasure doesn’t radiate from the players outwards until it reaches the likes of us at the back of the terraces, in a pale and diminished form, our fun is not a watery version of the team’s fun, even though they are the ones who get to score the goals and climb the steps at Wembley; the joy we feel on occasions like this isn’t a celebration of others’ good fortune, but a celebration of our own. The players are merely our representatives, and sometimes if you look hard you can see the little poles that join them together, and the handles at the side that enable us to move them.

I am a part of the club, just as the club is a part of me. This Wembley win belonged to me every bit as much as it belonged to Charlie Nicholas or George Graham, and I worked every bit as hard for it as they did. The only difference between me and them is that I have put in more hours, more years, more decades than them, and so have a better understanding of the afternoon, a sweeter appreciation of why the sun still shines when I remember it.

1 vicarious: experienced secondhand, or through another person.

2 Wembley is a football ground. Charlie Nicholas and George Graham are footballers.

Question 18

What is suggested by the statement that ‘those who say that they would rather do than watch, are missing the point’ (lines 2 and 3)?

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Question 19
How would you describe the attitude of the speaker? (2)
UNIT 12

Questions 20 and 21

Table 1 shows the average income per person for eight countries (A–H) in dollars.

Figure 1 shows the comparative use (%) of low cost transport (walking and/or cycling), public transport (buses and/or trains) and private car transport in countries A–H.

For example, Table 1 shows that country D has an average income of $11,875, and Figure 1 shows that for country D transport was 53% Private car, 35% Public transport and 12% Low-cost transport.

Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Average income ($)</th>
<th>High average income</th>
<th>Low average income</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>27,326</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>22,550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>14,102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>11,875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>1,605</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>605</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>170</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1
Question 20
What percentage of transport is undertaken by Private car in country E? (1)

Question 21
What do the table and figure show about the relationship between the comparative use of the three different forms of transport and a country’s average income per person? (4)
UNIT 13

Question 22
Examine the arguments of JM and BL about prisons below. (5)

What arguments are presented?
Which of their arguments are strong and which are weak?
Explain why you find their arguments either strong or weak.

Your responses will be judged on the:
• accuracy with which the views are presented; and
• effectiveness with which the arguments

Should prisons be for rehabilitation or for punishment?

JM comments
There is no justification to punish the vast majority of people in prison. Most prisoners are in gaol because society has forced them into a position where they have no alternative but to pursue (or are simply unable to avoid) a criminal lifestyle.

BL responds
No. You can take an anger management course if that’s your problem. You can get a job interview if you need money. You can clean up your act, you can go cold turkey, you have a choice.

It's a cop out to say that society completely influences people’s actions, that the thief doesn’t have the ultimate choice to not commit crimes, that the rapist is ‘driven’ to abuse. We punish people, we take our retribution from them, we want them to suffer to atone for and balance out the evil caused by them.

Prisons should only be concerned with rehabilitation in the interests of the honest and law abiding. After we’ve punished criminals, how do we want them when they are released? We want an overall reduction in crime, not an overall reduction in the amount of suffering endured by those who feel a need to commit it.

I personally believe that a major part of punishment is suffering, and that a major part of punishment in our country is prison. I guarantee you that there are more people in prison who deserve what they get than people who don’t.

JM responds
It’s easy for us to say “you have a choice”, but making the ‘right’ choice, if you want to call it that, is not so easy. Ever tried going cold turkey from a serious drug addiction? Ever tried growing up in poverty where all around you is nothing but crime and deviance, where everyone is at war against you and your community, and where you’re taught from the youngest age that police are the enemy? Go live there and then tell me how easy it is.

You want less crime? Then the first thing you want to do is change the way police operate and stop sending so many people to gaol, and change what gaols are like. We see the crime control problem as a ‘war’, a war against people who commit acts that are labelled ‘crimes’ and these criminals then become targets in this war. Rather than being subject to severe penalties, these people should be seen as indicators of severe social injustice. And as for gaols, well if you’re not a criminal when you go in, you will be by the time you’re out. They’re simply universities for criminals.
Question 22
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Acknowledgements
Arend Van Dam: http://www.arendvandam.com/actueel.php
http://www.allsmilesstudio.com/Caricatures/Celebrity_Caricatures/300/einstein.jpg
http://www.ppdlearning.co.uk/resources/archive/images/einstein.jpg
Nick Hornby, for extract from *Fever Pitch*, Victor Gollancz, London, 1992