Directions
Do not open this testpaper or start writing until the supervisor directs you to do so.

1 Time allowed: 1 hour 30 minutes

2 Perusal time: 10 minutes

3 Equipment:

<table>
<thead>
<tr>
<th>Permitted</th>
<th>Not permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>2B pencils</td>
<td>own paper</td>
</tr>
<tr>
<td>pencil sharpener</td>
<td>dictionary</td>
</tr>
<tr>
<td>eraser</td>
<td>thesaurus</td>
</tr>
<tr>
<td>ruler</td>
<td>protractor</td>
</tr>
<tr>
<td>approved calculator</td>
<td>drawing compass</td>
</tr>
<tr>
<td>highlighter</td>
<td>electronic devices</td>
</tr>
<tr>
<td>transparent container</td>
<td></td>
</tr>
<tr>
<td>other approved items</td>
<td></td>
</tr>
</tbody>
</table>

You are not permitted to borrow or lend equipment.

4 This testpaper has 50 test items, numbered 1 to 50.

5 The 50 items are arranged within 10 units.

6 For each item there are four alternative responses, represented by the letters A, B, C, D.

7 Respond to the items on the response sheet provided.

8 With your 2B pencil, blacken the whole area within one ○ to represent your response (A, B, C or D) to each item. If you want to change a response, follow Direction 3 on the response sheet.

9 Be vigilant about covering your response sheet. Turn it face down unless you are actually blackening an oval.

10 You may write on this testpaper but only your response sheet will be marked.

11 You may attempt the units in any order.

12 Points to observe:

   - Work through each unit, considering items in the order given.
   - Do not waste time on any one item. If you find an item too difficult, return to it later.
   - Even if you are unsure, make a decision and mark a response. Marks are not deducted for incorrect responses.

13 You will be given a warning 30 minutes before finishing time. You will be given a final warning 10 minutes before finishing time.
UNIT 1

Item 1

The following cartoon strip is by Wiley Miller.

Of the following ideas, which most strongly underpins this cartoon?

A  Tourists don't do enough to fit in.
B  Tourists are not the smartest people.
C  Tourists are targeted by practical jokers.
D  Tourists meet with unreasonable criticism.
UNIT 2

Items 2–3

A crater is a roughly circular depression with a raised rim, formed when a space rock hits the surface of a planet or moon.

In any given region, for a crater with diameter $D$ km, let $N$ be the number of craters with diameters greater than $D$ km.

Except for very small craters, scientists have observed that:
- when $D$ is doubled, $N$ decreases by a factor of 4;
- when $D$ is tripled, $N$ decreases by a factor of 9.

In general, the relationship between $N$ and $D$ is given by the formula $N = \frac{k}{D^3}$, where $k$ is a constant for a given region.

Item 2

In a region of a particular planet, 18 craters have diameters greater than 20 km.

How many craters in this region are expected to have diameters greater than 60 km?

A  one     C  three
B  two     D  six

Item 3

Which of the following correctly expresses $D$ in terms of $N$ and $k$ for the craters in a given region?

A  $D = \sqrt[3]{\frac{N}{k}}$  C  $D = \frac{\sqrt[k]{k}}{N}$
B  $D = \frac{k}{\sqrt[N]{N}}$  D  $D = \sqrt[3]{\frac{k}{N}}$
UNIT 3

Items 4–11

Acquainted with the night

I have been one acquainted with the night.
I have walked out in rain — and back in rain.
I have outwalked the furthest city light.

I have looked down the saddest city lane.
I have passed by the watchman on his beat
And dropped my eyes, unwilling to explain.

I have stood still and stopped the sound of feet
When far away an interrupted cry
Came over houses from another street,

But not to call me back or say good-bye;
And further still at an unearthly height
One luminary clock\(^1\) against the sky

Proclaimed the time was neither wrong nor right.
I have been one acquainted with the night.

Robert Frost

Note: \(^1\) a clock in the tower of the City Hall

Item 4

The first five lines of this poem imply that Frost is

A boasting his several achievements.
B confessing unpleasant secrets.
C affirming his way of being.
D regretting wasted time.

Item 5

Frost portrays the city mainly as a place of

A peril and fear.
B silence and security.
C challenge and confrontation.
D fragmentation and isolation.
Item 6

By dropping his eyes (line 6), Frost intends to convey that the watchman is

A  too concerned for Frost’s welfare.
B  suspicious of Frost’s motives.
C  unworthy of Frost’s attention.
D  an unwanted distraction.

Item 7

By saying he is ‘one acquainted with the night’, Frost acknowledges that he

A  has a strange affection for the night.
B  knows the night only as an observer.
C  has a sense of identity with the night.
D  dislikes the night despite his journeys.

Item 8

How does Frost regard the ‘luminary clock’ (line 12)?

A  It is something that makes no judgment of him.
B  It accompanies him as his only real companion.
C  It is something that affords him clarity and insight.
D  It offers him a welcome antidote to the harsh night.

Item 9

The clock in the City Hall tower serves to emphasise that

A  even at night one is never far from the familiar.
B  time ceases to have meaning in the dead of night.
C  the night is as much controlled by time as is the day.
D  time can do little to change the nightly habits of the poet.

Item 10

Judging from the language and rhythm of the poem, Frost’s night-journeying is most like

A  an aimless ramble.
B  a ritual procession.
C  a self-enforced march.
D  a hazardous adventure.
Item 11

The mood of which one of these paintings is most like that of the poem?
UNIT 4

Items 12–18

More than a thousand years ago a Persian mathematician devised a way to find the product of any two large numbers using a grid.

Figure 1 is an example of how a grid is prepared for calculation:

Suppose 78 is to be multiplied by 675. The digits of the first number are written above the columns (from left to right) and the digits of the second number are written beside each row (from top to bottom).

Each column digit is multiplied by each row digit. The products are recorded in the squares of the grid, e.g. $8 \times 6 = 48$ (in the top right square).

The method of calculating the final product will be explained later.

Item 12

Consider the grid at right.

Which of the following is one of the two numbers used to generate this grid?

A 376  C 753
B 397  D 796

Item 13

In the grid at right, some digits have been omitted.

The digits represented by P and Q are, respectively,

The following additional information refers to items 15 and 16.

Once the row and column digits are multiplied and the results entered in the grid, the following process can be used to calculate the final product. Figure 2 shows an example.

Starting at the bottom right corner, add the digits in each diagonal band (an example of which is shaded). Write the sum of each diagonal band below, and in line with, that band.

In Figure 2, the sum of $6 + 4 + 5$ is 15. Write down the 5, then add the 1 to the sum of the next band, i.e. $(8 + 5 + 9 + 3) + 1 = 26$. Write down the 6, then carry the 2 to the next diagonal, and so on.

After all the diagonal bands are summed, the resulting digits are read from left to right to give $52650$, which is the product of $78 \times 675$. 

Figure 2
Item 15

Consider the grid at right.

What is the product of this grid?

A 341495  C 359495
B 349495  D 361495

Item 16

Suppose Figure 2 is changed so that the order of the rows is reversed and the number 675 is written from the bottom row to the top. The digits are still to be summed along the diagonal bands. In each of the grids below, the top left square has been completed.

Which one of the following grids can be used to calculate the product, 52650?

A

B

C

D
The following additional information refers to items 17 and 18.

Each diagonal band within the grid represents a place value (units, tens, hundreds, etc.), working from bottom right to top left (see Figure 3).

For example, all the digits in the shaded diagonal band in Figure 3 are hundreds (800, 500, etc.).

So, the number in the top left square of this grid, 42, actually represents a value of \((4 \times 10000) + (2 \times 1000)\), which is 42000. In terms of the two numbers being multiplied, this is 70 (the '7' from 78) \(\times\) 600 (the '6' from 675).

**Figure 3**

---

**Item 17**

At left is a grid used to multiply a five-digit number by a four-digit number.

How many digits are in the hundred-thousands diagonal band?

A  five  C  seven

B  six  D  eight

---

**Item 18**

A grid is used to find the product 567 \(\times\) 893.

Which of the shaded squares below represents the largest value?

```plaintext
5  6  7
A  B  8
C  D
3  9
```
UNIT 5

Items 19–21

The following extract, adapted from a magazine article, comments on the significance of black and white imagery in films and photographs.

With the immense variety and saturation of colour everywhere in contemporary life thanks to digital imaging, it is perhaps no wonder that black and white is increasingly beguiling. Partly the allure is one of retro glamour, the fascinating strangeness of the recent past. But, according to cinematographer Roger Deakins, black and white also has unique aesthetic properties. ‘The sheer beauty of a well-composed and well-lit black and white image is hard to beat because it’s difficult to produce that type of focus and simplicity when you’re shooting in colour. It’s vitally important to be able to separate shapes and surfaces through the use of light and shade, and to focus the audience’s attention on what you want them to see.’

Item 19

Which of the following words can be substituted for ‘beguiling’ (line 3) without changing the meaning of the context?

A deceptive C disconcerting
B strange D intriguing

Item 20

The author suggests that producing an image in black and white

A creates nostalgia for a time when life was less complicated.
B adds mystery to the image by distancing it from present reality.
C offers a challenge for people to understand and relate to the image.
D attracts people because black and white is seen as more glamorous.

Item 21

Which of the following statements is Roger Deakins most likely to have made about the use of colour in images?

A It is of primary interest to most cinematographers.
B It is suitable only for subjects where beauty is central.
C It distracts attention away from form and composition.
D It is too commonplace to be useful in serious image-making.
UNIT 6

Items 22-26

At different times over the past 150 years, the record for the world's tallest tree has been held by one of three varieties of tree — the Australian Mountain Ash; and the Coastal Redwood and Douglas Fir, both of which grow on the west coast of North America.

The graph below shows the heights of the trees which were reliably measured and accepted as being the world record holders. Until 1914, these trees were measured after they had been cut down. The trees shown from the 1950s onwards were measured without being cut down and these trees continued to grow beyond the heights indicated in the graph. The trees which held the world record between 1915 and 1955 are not shown on this graph.
Item 22

Approximately how much taller than the Thorpdale tree (1880) was the tallest Douglas Fir on record?

A  8 m  
B  11 m  
C  15 m  
D  18 m

Item 23

Consider the seven trees which have held the world height record since 1955. Which one was closest to the average height of this group of trees?

A  Paradox (1995)  
B  Mendocino (1996)  
C  Libbey tree (1963)  
D  Stratosphere Giant (2000)

Item 24

On a different bar graph being drawn to show the tallest trees currently alive, the bar representing Hyperion’s full height is 60 mm high. The tallest living tree in Australia at present is Centurion, a 99.8 m tall Mountain Ash in Tasmania.

On this second bar graph, the height of the bar representing Centurion will be closest to

A  44 mm.  
B  49 mm.  
C  52 mm.  
D  58 mm.

Item 25

From the time the Dyerville Giant took the world record in 1972 until it was blown down by a storm in March 1991, its growth rate averaged 15 cm per year. The height of this tree just before it fell would have been closest to

A  110 m.  
B  112 m.  
C  124 m.  
D  128 m.

Item 26

In the early 1900s a public park in Mineral, Washington, contained a Douglas Fir tree which locals claimed to be the tallest living tree in the world. In 1905 a storm broke its top off, reducing its height by 43%. The broken top was measured at 51.2 m long. Just before the storm, approximately how much shorter was the Mineral tree than the Lynn Valley tree (1902)?

A  6 m  
B  14 m  
C  17 m  
D  35 m
UNIT 7

Items 27–32

In the following adapted extract, Graeme Blundell comments on the work of Australian comedian Chris Lilley, best known for his TV ‘mockumentaries’ including *Summer Heights High* and *Angry Boys*.

*Angry Boys* is dazzling, often outrageously funny and confronting. Lilley has developed a distinct idiom, a coat-hanger for his own personality that sets him, and his approach to his already loyal audience, material and even the outside world, apart from any other local performer.

Lilley works within tightly defined limitations, but many enviable kinds of freedom accompany his self-imposed restraints: he trusts his audience instead of having to keep it in a constant state of nervous stimulation. His acting is subtle though he obviously loves a set-piece and the chance for some comic capering; nothing is really underlined — a hand gesture, a held look, the prohibitive wink of an eyelid, a sudden, surprising burst of energy.

For all his obvious ability to create excruciatingly funny situations, Lilley never goes after the easy gag. You can almost sense him holding back at times. Even when he is seemingly ad-libbing, you sense him feinting, drawing the situation out, and refusing to deny the moment’s authenticity. Nothing too strained, contrived or broad is allowed to interfere with the realism of the show, its sense of absolute actuality.

Notes: ¹way of working
²in this context, a well-recognised comedy routine with a conventional form

Item 27

In the first sentence Blundell suggests that *Angry Boys* is

A potentially alienating because it is very risky.
B funny because it pushes boundaries to the limit.
C clever in the way it addresses important social issues.
D appealing only because of its confronting subject matter.

Item 28

‘Lilley has developed a distinct idiom … that sets him, and his approach … apart from any other local performer’ (lines 1–4).

In light of the extract as a whole, what does Blundell think about Lilley’s ‘separateness’?

A Lilley should follow his instincts despite criticism from other comedians.
B Lilley should do what he does best even if it stereotypes him.
C Lilley is content to pay a price for independence of mind.
D Lilley’s choice not to follow the crowd is commendable.
Item 29

In the second paragraph Blundell suggests that being able to trust his audience frees Lilley to

A  focus on edgy and confronting subjects.
B  devote his attention to comic set-pieces.
C  explore situations with nuance and perceptiveness.
D  engage with issues beyond his self-imposed restraints.

Item 30

In lines 6 and 7 Blundell implies that other comedians

A  try to control their audiences because they’re unsure how audiences will respond.
B  need to go for ‘cheap gags’ because their humour is not as clever as Lilley’s.
C  are less constrained than Lilley so can keep their audiences more stimulated.
D  develop routines that leave their audiences surprised and wanting more.

Item 31

Which of the following words describes Lilley’s typical manner of delivery, as understood by Blundell (lines 7–10)?

A  emphatic  C  flippant  
B  flamboyant  D  understated

Item 32

In lines 12–15 Blundell suggests that, when Lilley records scenes for his TV shows, he

A  deliberately departs from audiences’ expectations in order to engage them.
B  introduces small changes to keep the scenes grounded and believable.
C  keeps tightly to a script, even when he seems to be making it up.
D  modifies them as he goes along according to his instincts.
UNIT 8
starts inside
this fold-out section.

Fold out this page and leave
it open while you work
through this unit.
UNIT 8

Items 33–38

Lightning is classified as either cloud flashes (c), that go between clouds, or ground flashes (g), that go between clouds and the ground. Researchers measure the density of flashes, i.e. the number of flashes recorded per square kilometre per year. The three measures of lightning density are:

- cloud flash density: number of cloud flashes per square kilometre per year \((N_c/\text{km}^2/\text{yr})\);
- ground flash density: number of ground flashes per square kilometre per year \((N_g/\text{km}^2/\text{yr})\);
- total flash density: total number of lightning flashes per square kilometre per year \((N_t/\text{km}^2/\text{yr})\).

Note: \(N_t = N_c + N_g\)

The map below, published in 2006, shows \(N_t/\text{km}^2/\text{yr}\), calculated as an average over a seven-year period. Because these are calculated averages, the values are not necessarily whole numbers.
Item 33

According to the map, which state or territory has only areas that received more than one, but no more than 15, lightning flashes/km²/yr?

A  Northern Territory  
B  New South Wales  
C  Queensland  
D  Victoria

Item 34

Which of the following groups of cities/towns contains only places that received a total of $>35-70$ flashes/km² over the course of the seven-year recording period?

A  Emerald (Qld), Coffs Harbour (NSW), Tennant Creek (NT)  
B  Callide Dam (Qld), Hughenden (Qld), Nowra (NSW)  
C  Grafton (NSW), Port Hedland (WA), St George (Qld)  
D  Ballarat (Vic.), Brisbane (Qld), Mt Isa (Qld)

The following additional information refers to items 35–37.

In general, cloud flashes occur twice as frequently as ground flashes.

Reminder: $N_I = N_c + N_g$

Item 35

Of the following, which is most likely to have been the number of ground flashes/km²/yr recorded at Kununurra (WA)?

A  8  
B  12  
C  16  
D  24
The following additional information refers to items 36–38.

A ‘thunder-day’ is a day on which any thunder is detected at a weather station. There are days when thunder is heard but no lightning recorded. The relationship between the number of thunder-days, \( T \), and ground flashes, \( N_g \), can be represented by the formula:

\[
N_g = 0.012 T^{1.4}.
\]

The table below provides selected values for \( T \) and corresponding values for \( T^{1.4} \).

<table>
<thead>
<tr>
<th>( T )</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>50</th>
<th>75</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T^{1.4} )</td>
<td>9.5</td>
<td>25.1</td>
<td>44.3</td>
<td>66.3</td>
<td>90.6</td>
<td>116.9</td>
<td>239.1</td>
<td>421.8</td>
<td>1665.1</td>
</tr>
</tbody>
</table>

**Item 36**

Of the following, which is most likely to be the number of ground flashes/km\(^2\)/yr at a location with an average of 100 thunder-days per year?

A 6  
B 8  
C 10  
D 24

**Item 37**

The number of thunder-days recorded at a site receiving two ground flashes/km\(^2\)/yr is most likely to be closest to

A 5  
B 35  
C 40  
D 45

**Item 38**

Which one of the following gives a correct expression for \( N_t \) in terms of \( T \) and \( N_g \)?

A \( N_t = 0.036 T^{1.4} \)

B \( N_t = 3.012 T^{1.4} \)

C \( N_t = 0.012 T^{1.4} + 3N_g \)

D \( N_t = 3(0.012 T^{1.4}) + N_g \)
Items 39–45

The following adapted extract is from a novel set on a Greek island during World War II, when the island was invaded by the Italian and German armies. In this extract, two Italian soldiers — Antonio Corelli and Carlo Guercio — are having a conversation with Günter Weber, a German soldier. Corelli has just spoken in defence of a local man who accused some Italian soldiers of stealing food.

Weber smiled, ‘You are very famous for defending the rights of Greeks. I wonder sometimes if you understand why you are here.’

‘I’m not here to be difficult,’ said Corelli, ‘and to be perfectly frank, I do not feel good about it. I try to think of it as a holiday. I don’t have your advantages, Günter.’

‘Advantages?’

‘Yes. I don’t have the advantage of thinking that other races are inferior to mine. I don’t feel entitled, that’s all.’

‘It’s a question of science,’ said Weber. ‘You can’t alter a scientific fact.’

Corelli frowned. ‘Science? The Marxists think they are scientists, and they believe the exact opposite of you. I don’t care about science. It’s an irrelevance. It’s a moral principle that you can’t alter, not a scientific fact.’

‘We disagree,’ said Weber amiably, ‘it’s obvious to me that ethics change with the times as science does. Ethics have changed because of the theories of Darwin.’

‘You’re right, Günter,’ interjected Carlo, ‘but no one has to like it. I don’t like it, and neither does Antonio, that’s all. And science is about facts, and morality is about values. They are not the same thing and they don’t grow together. No one can find a value on the slide of a microscope. It might be true that some races are evil or inferior ... how would I know? But how does that mean that we should treat them with injustice? I don’t understand the reasoning.’

‘Strength is the new morality,’ said Weber. ‘Strength needs no excuses and doesn’t have to give reasons. It is Darwinism, as I said.’

‘It has to leave reasons to history,’ said Corelli, ‘or else it stands condemned. It’s also a question of being at ease with oneself. That is my morality. I make myself imagine that it’s personal.’

‘You’re a good man,’ said Günter, ‘I admit it.’

Notes: ¹used here by Corelli to mean the communists of the former Soviet Union
²Charles Darwin, the 19th century naturalist who proposed the theory of evolution by natural selection
³Günter believes that ‘Darwinism’ can be summarised in the phrases ‘survival of the fittest’ and ‘might makes right’.

Item 39

In saying ‘I don’t have your advantages’ (line 4), Corelli is

A criticising Weber but in a stealthy manner.
B confirming that Weber makes him feel inferior.
C conceding that Weber is better informed than he is.
D acknowledging the practical value of Weber’s attitude.
Item 40

Corelli thinks that science is irrelevant (line 10) because it
A is used by Marxists, for whom he has little respect.
B is a subject about which he knows little and cares less.
C keeps changing its ‘facts’ so that it can never be trusted.
D has the capacity to be used in support of opposing beliefs.

Item 41

How does Weber respond to the claim (line 6) that Germans believe they are racially superior?
A He outwardly supports the view but inwardly has doubts about it.
B He acknowledges that it is a popular belief amongst Germans.
C He regards the view as a truth over which he has no control.
D He rejects the view as a Marxist distortion of the facts.

Item 42

Which of the following best captures Carlo’s views, as expressed in lines 14–19?
A Though there might be differences between peoples, everyone should be treated properly.
B The idea of racial superiority ought to be rejected because it is based on poor science.
C However objectionable it may be, racial superiority is a fact that has to be dealt with.
D The scientific and the moral arguments are too complex to allow for easy answers.

Item 43

Weber’s attitude during this conversation stems from his
A unquestioning and unquestionable strength of conviction.
B belief that the topic discussed has no relevance to him.
C understanding that this is not an argument he can win.
D desire not to give offence to his Italian colleagues.

Item 44

How does Corelli determine the merits of other ‘moralities’?
A He prefers those which offer some self-justification.
B He prefers to leave it to history to pass judgment on them.
C He analyses their arguments in a detached and objective manner.
D He compares them with what he would do in given circumstances.

Item 45

In this extract, Günter Weber comes across as being
A inflexible but polite.
B arrogant but knowledgeable.
C condescending but engaging.
D strong-willed but accommodating.
UNIT 10

Items 46–50

Figure 1 shows the percentages, by gender, of Australian adult smokers, ex-smokers (i.e. those who have quit), and adults who have never smoked, for the years 1977, 1995 and 2007. Each dot, irrespective of its colour or size, represents 1% of the population of that gender for the specified year.

KEY
- current smokers
- ex-smokers
- never smoked

Figure 1: Prevalence of smoking in adult Australians in 1977, 1995 and 2007
Item 46

The smallest average annual decrease in the percentage of adult smokers in Australia was for

Item 47

Another category, 'non-smokers', is made up of ex-smokers and those who have never smoked.

Which of the following statements in regard to non-smokers is consistent with information in Figure 1?
A In 2007, there were almost four adult male non-smokers for every adult male smoker.
B In 1977, slightly more than two-thirds of adult male non-smokers had never smoked.
C In 1977, about one-sixth of adult female non-smokers were ex-smokers.
D In 1995, nine out of every ten adult females were non-smokers.

Item 48

In 2007, 3.13 million adult Australians smoked. Of these, 1.66 million were male.

The number of adult female Australians who were ex-smokers in 2007 was closest to
A 340000.
B 1470000.
C 1880000.
D 2210000.

Item 49

Decreases in the proportion of adults smoking result from two factors:
- fewer adults taking up smoking;
- more adults quitting.

For which of the following was there an overall decrease in the proportion of adults smoking that resulted from both factors?
A females between 1995 and 2007
B females between 1977 and 1995
C males between 1995 and 2007
D males between 1977 and 1995
Item 50

The adult Australian female population in 1995 was 6812400, while in the same year there were 6739900 adult Australian males.

In 1995, the number of adults classified as ex-smokers was closest to

A  3791000.  
B  3795000.  
C  4472000.  
D  6579000.