MSAP
Mature Students Admissions Pathway

Sample Questions

Module 1 – Written English (1 hour)
Module 2 – Reasoning in the Humanities and Social Sciences (1 hour)
Module 3 – Reasoning in the Sciences, Mathematics and Social Sciences (1 hour)

This booklet contains sample questions only.

For detailed advice and tips about the test, please refer to the MSAP website and the Practice Test booklet available for purchase.

Please print required pages only
Sample Topics for MSAP Module 1 – Written English

Directions
You are required to produce two pieces of writing – one in response to a topic from Task A, and one in response to a topic from Task B.

• Task A is a more formal public affairs issue that invites argument.
• Task B is a less formal topic that invites more personal reflection.
• One hour is allocated for this test, with an additional five minutes reading time.
• Your responses to the topics are written directly onto the test paper. You should write your essays neatly in pen.
• Use a planning page to organise your thoughts before you commence writing.
• Write the number of the topic you are responding to at the top of each response. NB: Do not try to address all of the other topics in your response.
• Give each piece of writing a title that will help orient the reader to the approach you are taking.
• No extra paper is to be used. Only one test booklet is permitted per candidate.

The following themes and topics indicate the kind of stimulus material that will be offered in the real test.

Topics

Task A: Discussion of a current affairs theme – Respond to one (1) topic from Task A.

1. Our society is changing a great deal, but change is not always progress, and there are some ways in which our society is changing for the worse.
2. There has never been a time in human history when so many people have been able to live a safe and secure life, and we have science and technology to thank for such benefits.
3. Science and technology have brought many benefits, but they have also brought problems that may eventually negate those benefits.
4. Science has made great progress in understanding the physical world, but science has not made much progress in understanding the human world.

Task B: Personal point of view – Respond to one (1) topic from Task B.

5. Friendship is something that most people see as very important, but most friendships turn out to be superficial and fragile.
6. Romances come and go, but it is friendship that remains.
7. It is important that we learn to be confident within ourselves rather than dependent on the good opinion of others.
8. You have to work at a friendship, because without tolerance and respect, even the best friendships soon disappear.
MSAP Module 2 –
Reasoning in the Humanities and Social Sciences
Sample multiple-choice questions
UNIT 1

Questions 1 – 5

This unit is based on the diagram on the opposite page.

1. The El Niño phenomenon is first indicated by variations in
   A. water currents.
   B. storm clouds.
   C. jet streams.
   D. winds.

2. The cross-section diagrams to the right of the main map draw attention to the effects of
   A. cold water in creating rough seas and rain-bearing storm clouds.
   B. unnatural increases in water volume on overall sea levels.
   C. global warming on the average temperature of the ocean.
   D. warm water fluctuations on weather and the food chain.

3. In an El Niño year, absence of warm water is likely to cause Indonesia to experience
   A. storms.
   B. reduced rainfall.
   C. cold wind blasts.
   D. stronger jet streams.

4. One effect of El Niño in 1982 was to destroy the anchovy fishing industry in Peru. According to the
   information given in the diagrams and text, the most likely reason for this was that
   A. stronger trade winds off the coast of Peru made fishing hazardous.
   B. the fish were driven away by cold water welling up from below.
   C. jet streams redirected to the south caused havoc.
   D. the fish were deprived of food.

5. In an El Niño year floods are caused in desert regions of South America because
   A. the southerly jet stream from Indonesia has caused more wetness and cold.
   B. deep cold water has risen abnormally to flood proportions.
   C. large areas of warm water have settled along the coast.
   D. overall sea levels have dropped due to trade winds.
Normal Year: The trade winds blow from east to west, pulling warm water behind. Cold, nutrient-rich water wells up from below, supporting the Pacific food chain.

El Niño Year: The warm, stationary warm water prevents upwelling. Fish stocks fall.

Normal Year: A pool of warm water sits off Indonesia, bringing rains to the region.

El Niño Year: The warm water sloshes east, taking the storm clouds with it.

Normal Year: The jet streams deliver rain to southern Mexico and the Pacific Northwest.

El Niño Year: The jet streams shift north, and so do the rains.
UNIT 2

Question 6

6 Which two of statements (i) – (iv) below are most similar to each other in the attitude to equality presented?

(i) Although people possess unequal powers, they nonetheless deserve equal rights.

(ii) People are made by nature unequal. It is vain, therefore, to treat them as if they were equal.

(iii) Kneeling ne’er spoil’d silk stocking; quit thy state;
     All equal are within the church’s gate.

(iv) The wealth of a nation consists more than anything else in the number of superior people it harbours.

A statements (i) and (iii)
B statements (ii) and (iii)
C statements (i) and (iv)
D statements (iii) and (iv)
UNIT 3

Questions 7 – 9

The following passage is from a social history of an inner suburb of Melbourne, Australia.

Compulsory education signified a massive intervention by the educated and the affluent in the private lives of the poor, and it is clear that many working-class families initially resisted. In 1882 Yarra Park had 1742 children on its rolls and an average attendance of a mere 872. And while truancy rates fell over the next thirty years, many Edwardian children were spectacular truants, often aided and abetted by parents who resented the schools that sought to deprive them of their children’s labour and company.

Many parents saw little value in education that, in their view, wasted time on subjects and skills that were not relevant to paid work. The very poor needed their children in the workforce as early as possible.

But as compulsory attendance became a fact of life, acceptance of the authority of the school grew, because working-class parents came to realise that their children’s best hope of escape from poverty lay in education. Nonetheless, some of the Victorian and Edwardian parents who resisted the school’s appropriation of their children’s time dimly perceived, perhaps, that it was an attack on the autonomy of the family. For all the benefits of the increasing role of the Welfare State and the explosion of the helping professions, there have been some losses among the multitude of gains. Poverty and helplessness have not been abolished, only mitigated. People and families in need have lost some of their autonomy and dignity as politicians, bureaucrats and professionals diagnose and decide for them without asking what they would like. Successful protest through the ballot box only replaces these decision makers with another team who are still politicians, bureaucrats and professionals. And it has been the people of the working class who are least equipped to defend themselves against the modern policing of the family. Their poverty prevents them from making private arrangements to service their needs; their lack of confidence inhibits them from battling the indifference of politicians and bureaucrats; their ignorance intimidates them in the face of doctors, social-workers and, of course, teachers.

7  ‘In 1882 Yarra Park had 1742 children on its rolls and an average attendance of a mere 872.’ (lines 3 and 4)

The writer produces this statistic to suggest that

A parents were too ignorant to realise the benefits of schooling for their children.
B formal education was regarded as unimportant by a large proportion of families.
C working-class families mounted a campaign against the intrusion of the educated and the affluent.
D truant children were exceptionally cunning at evading both their parents and the school authorities.

8  In the writer’s view, the impact of the Welfare State on working-class families has been

A beneficial, although it has weakened their independence.
B subtle, although it has radically changed the class structure.
C disastrous, because it has worsened their material situation.
D negligible, since the benefits have all been in favour of the middle-class.

9  The writer suggests that for working-class people the power of the vote

A is useless because all politicians are corrupt and self-interested.
B has given them the opportunity to put social reform on the agenda.
C does not represent any real opportunity to increase their autonomy.
D has had a greater impact on their welfare than compulsory education.
Questions 10 and 11

10 The cartoon is a comment on

A corporate loyalty.
B the value of teamwork.
C the social implications of a casualised workforce.
D the social implications of a decentralised workforce.

11 The cartoon suggests that current work practices are

A quaint.
B congenial.
C unsatisfying.
D unproductive.
UNIT 5

Questions 12 – 14

The best way to grasp the human significance of photography is not to think of camera, film and tripod as something external to human nature, but as evolutionary developments — as much a part of human nature as one’s thumb. A deficiency existed, of sorts, in the way our sensory and information storing capacities functioned. They had limits, and photography was one way to overcome those limits. The limit in human functioning is simply this: though we can see things very well, we cannot reliably bring up the image for repeated viewing. Instead, visual images are incompletely stored in memory, often in a highly schematic form, and subject to decay and distortion.

Moreover, memory is private: it does not directly take the form of an external object that others can see. And when the person dies, all of the images stored in his or her brain vanish. It is the perishability of our visual experience that led humankind to seek to fix it by placing it on a more permanent record, more available to public scrutiny than the brain. A first solution to this problem came about through the development of skills in painting and drawing. Humankind had the capacity to depict what was seen by representing those forms and colours on an external surface, such as the wall of a cave, or papyrus, silk or canvas. But it required a special talent to do this, which only a few people possessed.

12 The limitation in human functioning referred to in the first paragraph is best described as an inability to

A view things accurately enough for all purposes.
B instantaneously process a complete visual image.
C store a detailed image of something one has seen.
D recall visual material accurately, particularly over a period of time.

13 The writer uses the example of a person’s thumb and evolutionary development (lines 2 and 3) to make the point that the camera

A has replaced part of humankind’s sensory capacities.
B is essentially an extension of humankind’s sensory capacities.
C has utilised sensory capacities in humankind which were previously undeveloped.
D has been so widely accepted by humankind that it has become a crutch on which we are dependent.

14 The additional limitations of memory described in lines 9–12 relate to humankind’s

A need for self-expression.
B insistence on the right to privacy.
C desire to communicate observations.
D need to keep detailed records on individuals.
UNIT 6

Questions 15 – 19

The following passage is from a novel set in 1920s America.

Jordan Baker instinctively avoided clever, shrewd men, and now I saw that this was because she felt safer on a plane where any divergence from a code would be thought impossible. She was incurably dishonest. She wasn’t able to endure being at a disadvantage and, given this unwillingness, I suppose she had begun dealing in subterfuges when she was very young in order to keep that cool, insolent smile turned to the world and yet satisfy the demands of her hard, jaunty body.

It made no difference to me. Dishonesty in a woman is a thing you never blame deeply – I was casually sorry, and then I forgot. It was on that same house-party that we had a curious conversation about driving a car. It started because she passed so close to some workmen that our fender flicked a button on one man’s coat.

‘You’re a rotten driver,’ I protested. ‘Either you ought to be more careful, or you oughtn’t to drive at all.’

‘I am careful.’

‘No, you’re not.’

‘Well, other people are,’ she said lightly.

‘What’s that got to do with it?’

‘They’ll keep out of my way,’ she insisted. ‘It takes two to make an accident.’

‘Suppose you met somebody just as careless as yourself.’

‘I hope I never will,’ she answered. ‘I hate careless people. That’s why I like you.’

Her grey, sun-strained eyes stared straight ahead, but she had deliberately shifted our relations, and for a moment I thought I loved her. But I am slow-thinking and full of interior rules that act as brakes on my desires, and I knew that first I had to get myself definitely out of that tangle back home. I’d been writing letters once a week and signing them: ‘Love, Nick,’ and all I could think of was how, when that certain girl played tennis, a faint moustache of perspiration appeared on her upper lip. Nevertheless there was a vague understanding that had to be tactfully broken off before I was free.

Every one suspects himself of at least one of the cardinal virtues, and this is mine: I am one of the few honest people that I have ever known.

15 The narrator presents Jordan Baker’s dishonesty as a form of

A versatility.
B vengefulness.
C self-possession.
D self-preservation.

16 Jordan Baker most likely hates ‘careless people’ (line 19) because they

A limit her freedom.
B awaken her conscience.
C undermine her attention-seeking.
D are inconsiderate of others’ feelings.
17 The narrator recalls his relationship ‘back home’ (line 23) with a sense of
   A nonchalance.
   B apprehension.
   C responsibility.
   D powerlessness.

18 When he calls himself ‘honest’ (line 28), the narrator means that he is
   A magnanimous.
   B principled.
   C innocent.
   D selfless.

19 When he states, ‘I am one of the few honest people that I have ever known’ (lines 27 and 28), the
   narrator presents his own honesty as a
   A choice.
   B marvel.
   C limitation.
   D conceitedness.
UNIT 7

Questions 20 – 24

This unit is based on two extracts from a nineteenth-century novel. Lydgate is a young doctor who has recently come to the town of Middlemarch. Rosamond Vincy is the daughter of the mayor. The passage describes Lydgate’s and Rosamond Vincy’s early impressions of each other.

As he walked away from Mr Vincy’s, Lydgate thought of Rosamond and her music only in the second place; and though, when her turn came, he dwelt on the image of her for the rest of his walk, he felt no agitation, and had no sense that any new current had set into his life. He could not marry yet; he wished not to marry for several years; and therefore he was not ready to entertain the notion of being in love with a girl whom he happened to admire. He did admire Rosamond exceedingly; but that madness which had once beset him about Laure was not, he thought, likely to recur in relation to any other woman. Certainly, if falling in love had been at all in question, it would have been quite safe with a creature like this Miss Vincy, who had just the kind of intelligence one would desire in a woman — polished, refined, docile, lending itself to finish in all the delicacies of life, and enshrined in a body which expressed this with a force of demonstration that excluded the need for other evidence. Lydgate felt sure that if ever he married, his wife would have that feminine radiance, that distinctive womanhood which must be classed with flowers and music, that sort of beauty which by its very nature was virtuous, being moulded only for pure and delicate joys.

But since he did not mean to marry for the next five years — his more pressing business was to look in Louis’ new book on Fever, which he was specially interested in, because he had known Louis in Paris, and had followed many anatomical demonstrations in order to ascertain the specific differences of typhus and typhoid.

He was an ardent fellow, but at present his ardour was absorbed in love of his work and in the ambition of making his life recognised as a factor in the better life of mankind — like other heroes of science who had nothing but an obscure country practice to begin with.

Poor Lydgate! or shall I say, Poor Rosamond! Each lived in a world of which the other knew nothing. It had not occurred to Lydgate that he had been a subject of eager meditation to Rosamond, who had neither any reason for throwing her marriage into distant perspective, nor any pathological studies to divert her mind from that ruminating habit, that inward repetition of looks, words, and phrases, which makes a large part of the lives of most girls. He had not meant to look at her or speak to her with more than the inevitable amount of admiration and compliment which a man must give to a beautiful girl. But Rosamond had registered every look and word, and estimated them as the opening incidents of a preconceived romance — incidents which gather value from the foreseen development and climax. In Rosamond’s romance it was not necessary to imagine much about the inward life of the hero, or of his serious business in the world; of course, he had a profession and was clever, as well as sufficiently handsome; but the piquant fact about Lydgate was his good birth, which distinguished him from all Middlemarch admirers, and presented marriage as a prospect of rising in rank and getting a little nearer to that celestial condition on earth in which she would have nothing to do with vulgar people, and perhaps at last associate with relatives quite equal to the county people who looked down on the Middlemarchers.
20 What interests Rosamond most about Lydgate?

A  his money  
B  his profession  
C  his social status  
D  his personal attractiveness

21 Lydgate imagines that his future wife will be

A  passionate and desirable.  
B  able to share his interests.  
C  intelligent and challenging.  
D  admirable but undemanding.

22 In what sense does Lydgate feel ‘safe’ (line 8) about Miss Vincy?

A  He is sure he will never fall in love again.  
B  He feels that women like her are not attractive to him.  
C  He feels confident that she would not make him lose control over his feelings.  
D  He thinks that he has at last found someone who will provide him with love and security.

23 Which one of the following best describes Lydgate’s motivation in his work?

A  intellectual curiosity, ambition and altruism  
B  a fanatical obsession with fever research  
C  the need to establish himself financially  
D  a desire for status to impress Rosamond

24 Later in the novel Lydgate and Rosamond marry, and their marriage is a disaster.  
What emerges most strongly from the passage to foreshadow difficulties in the marriage?

A  The attraction between them is only physical.  
B  Neither appreciates the strengths of the other.  
C  Neither has given much thought to the future.  
D  Neither has any sense of the other’s inward life.
UNIT 8

Questions 25 – 31

The poems in this unit are on the subject of war.

Break of Day in the Trenches

The darkness crumbles away —
It is the same old druid Time as ever
Only a live thing leaps my hand —
A queer sardonic rat —
As I pull the parapet’s poppy
To stick behind my ear.
Droll rat, they would shoot you if they knew
Your cosmopolitan sympathies.
Now you have touched this English hand
You will do the same to a German —
Soon, no doubt, if it be your pleasure
To cross the sleeping green between.
It seems you inwardly grin as you pass
Strong eyes, fine limbs, haughty athletes
Less chanced than you for life,
Bonds to the whims of murder,
Sprawled in the bowels of the earth,
The torn fields of France.
What do you see in our eyes
At the shrieking iron and flame
Hurled through still heavens?
What quaver — what heart aghast?
Poppies whose roots are in man’s veins
Drop, and are ever dropping;
But mine in my ear is safe,
Just a little white with the dust.

Isaac Rosenberg

25 Consider lines 7 to 15. In the context of the whole poem, these lines primarily convey

A. an angry assertion that both the enemy and the rat should be shot.
B. a wry observation that the rat has a freedom denied to the fighting man.
C. condemnation of the ‘haughty athletes’ being forced to fight in rat-infested trenches.
D. underlying confidence that in this war German and English forces are evenly matched.

26 ‘In these lines the tone becomes more directly emotional and personal than elsewhere in the poem.’

To which part of the poem does this critical comment best apply?

A. lines 3–6
B. lines 7–14
C. lines 19–22
D. lines 23–26
27 The images of the poppy and the rat in this poem are best described as

A portraying the irony of man’s position in war.
B distracting attention away from the agony of war.
C symbolising the way all forms of life are equally threatened by war.
D dramatising parts of the war scene removed from the location of this battle.

28 In the poem as a whole, the poet places the emphasis on

A suggesting the strange conditions under which life continues in war.
B making explicit his sense of serenity despite the shattering experience of war.
C expressing his own sense of remoteness from nature as life is destroyed around him.
D presenting a description of the landscape in order to suggest the shattering experience of war.

Question 29 relates to the following poem.

Grass
Pile the bodies high at Austerlitz and Waterloo
Shovel them under and let me work —
I am the grass; I cover all.
And pile them high at Gettysburg
And pile them high at Ypres and Verdun
Shovel them under and let me work.
Two years, ten years, and passengers ask the conductor:
What place is this?
Where are we now?
I am the grass.
Let me work.

Carl Sandburg

Note: The places mentioned in the poem were sites of battles involving a great loss of life.

29 Which one of the following best describes the tone of the poem?

A sympathetic, with a note of nostalgia
B bitter, with a note of derision
C compassionate, yet irritated
D contemptuous, yet humble
Questions 30 and 31 involve comparisons of the poems.

30 An important similarity between the two poems is that both poets

A present man at war as beyond redemption.
B stress that the real suffering in war is not found on the battlefield.
C accept war itself as unavoidable although it involves irretrievable losses.
D comment about war without considering the issue of which side is in the right.

31 Which one of the following indicates a significant similarity between the activity of the rat and of the grass, as presented in the first and second poems respectively?

A Their activity, though detached from man, is presented as continuing in the proximity of the war scene.
B Their activity is impulsive and random, reflecting the disruption of the countryside.
C Their activity suggests that they identify with and share in man’s suffering.
D Their activity indicates that they support man’s actions and presence.
UNIT 9

Questions 32 – 35

The following passage describes the experiences of a man who has undergone surgery that has given him vision after a lifetime of blindness.

One man when shown an orange a week after beginning to see, said that it was gold. When asked, ‘What shape is it?’ he said, ‘Let me touch it and I will tell you!’ After doing so, he said that it was an orange. Then he looked long at it and said, ‘Yes, I can see that it is round.’ Shown next a blue square, he said it was blue and round. A triangle he also described as round. When the angles were pointed out to him he said, ‘Ah. Yes, I understand now, one can see how they feel.’ For many weeks and months after beginning to see, the person can only with great difficulty distinguish between the simplest shapes, such as a triangle and a square. If you ask him how he does it, he may say, ‘Of course if I look carefully I see that there are three sharp turns at the edge of one patch of light, and four on the other.’ But he may add peevishly, ‘What on earth do you mean by saying that it would be useful to know this? The difference is only very slight and it takes me a long time to work it out. I can do much better with my fingers.’ And if you show him the two shapes the next day he will be quite unable to say which is a triangle and a square.

32 One week after beginning to see, the man
   A related shape directly to visual images.
   B formed visual impressions of shape indirectly.
   C spontaneously reduced his dependence on his sense of touch.
   D was developing a visual appreciation of shape through association with colour.

33 The man’s mistake about the square (lines 3 and 4) suggests that
   A his eyesight was still impaired.
   B he could not make full use of visual clues.
   C the idea of shape was meaningless for him.
   D colour makes shape perception more difficult.

34 The passage suggests that the man refers to the shapes as ‘one patch of light’ (line 8) because
   A he does not know the names of shapes.
   B he does not associate visual images with shapes.
   C he wants to be precise in order to make his reasoning clear.
   D he wants to choose wording which will convey the difficulty of his task.

35 The passage presents shape perception as generally dependent on
   A experience.
   B keen eyesight.
   C inherited skills.
   D colour perception.
MSAP Module 3 –
Reasoning in the Sciences, Mathematics and Social Sciences
Sample multiple-choice questions

Please note: these 35 practice questions are numbered 36 – 70. This is as they will appear in the actual test to prevent candidates answering on the incorrect section of the answer sheet. The questions in Module 2 are numbered 1 – 35.
UNIT 10

Questions 36 – 38

The rate at which freshwater animals absorb dissolved oxygen (O₂) from the surrounding water is affected by the water current.

Data on the effect of the speed of the current on the rate of oxygen absorption of some groups of freshwater animals at a temperature of 18 °C are shown in the figure. The data for individuals of each group of animals have been averaged and plotted in the figure as points which have been linked together. Different groups of the same species are numbered (e.g. Baetis 1, Baetis 2, and Baetis 3).
36. At a current speed of between 2 and 3 centimetres per second, the group of animals with the highest rate of oxygen consumption was

A. *Hydropsyche.*
B. *Baetis.*
C. *Rhyacophila.*
D. *Rhithrogena.*

37. Which of the following had a rate of oxygen consumption which was least affected by increasing the speed of the current?

A. *Ephemera.*
B. *Hydropsyche.*
C. *Anobaoia.*
D. *Anobaoia.*

38. According to the figure, groups of animals of the same species showed differences in their rates of oxygen consumption with increasing current speed.

The differences were most marked in

A. *Baetis.*
B. *Ephemera.*
C. *Anobaoia.*
D. *Hydropsyche.*
UNIT 11

Questions 39 – 42

The *Burger Index* (BI) uses the cost of a burger in different countries as a way of determining whether official exchange rates are appropriate (with respect to the US$).

- **BI** = \( \frac{\text{Cost of a burger in a particular country in the local currency}}{\text{Cost of a burger in the USA in US$}} \)

Comparing actual exchange rates with the BI indicates whether a currency is undervalued or overvalued.

- % over/undervaluation against US$ = \( \frac{(\text{BI} - \text{Exchange Rate})}{\text{Exchange Rate}} \times 100 \)

For example, if a burger costs €2.50 (2.50 Euros) in Europe and $2.50 in the USA, then the BI is \( \frac{2.50}{2.50} \), or 1.00.

The % the Euro is over/undervalued = \( \frac{1.00 - 0.80}{0.80} \times 100 = 25% \).

Thus, according to the BI, the Euro is overvalued against the US$ by 25%.

The table shows the typical cost of a standard burger in a number of countries in their local currencies and typical exchange rates of those countries against the US$ in a particular time period.

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost of burger in local currency</th>
<th>Exchange rate 1 US$ =</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>US$2.50</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>A$3.00</td>
<td>A$1.30</td>
</tr>
<tr>
<td>UK</td>
<td>£2.00</td>
<td>£0.50</td>
</tr>
<tr>
<td>European Union</td>
<td>€2.50</td>
<td>€0.80</td>
</tr>
<tr>
<td>Mexico</td>
<td>20 Peso</td>
<td>10 Peso</td>
</tr>
<tr>
<td>New Zealand</td>
<td>NZ$4.00</td>
<td>NZ$1.40</td>
</tr>
<tr>
<td>Russia</td>
<td>40 Rouble</td>
<td>30 Rouble</td>
</tr>
<tr>
<td>South Korea</td>
<td>3000 Won</td>
<td>1000 Won</td>
</tr>
</tbody>
</table>

- Answer the questions for the typical costs and exchange rates given for the time period.
- Assume there is no charge in converting money from one currency to another.

39 How many Mexican Pesos would be required to buy a burger in South Korea?

A 3 Pesos
B 30 Pesos
C 3000 Pesos
D 30 000 Pesos
40. According to the BI, a currency is generally correctly valued with respect to the US$ when the BI equals
   A. 0.
   B. 1.0.
   C. the Exchange Rate.
   D. \( \frac{1}{\text{Exchange Rate}} \).

41. According to the BI, how does the UK£ compare to the US$?
   A. The £ is 60% overvalued.
   B. The £ is 60% undervalued.
   C. The £ is correctly valued.
   D. There is insufficient information to determine if the value is appropriate.

42. According to the BI, the currency of which of the following countries is most undervalued against the US$?
   A. South Korea
   B. Mexico
   C. Russia
   D. New Zealand
UNIT 12

Questions 43 – 47

In some areas of the world, marine birds such as kelp gulls feed on mussels which have been deposited on the beaches. To break open the shells, the birds carry the mussels to heights and drop them onto hard surfaces, such as rocks or wet beach sand.

Experimental evidence indicates that the minimum drop height required to fracture a mussel shell depends on its size, and also on the nature of the surface onto which it is dropped. Moreover, the speed on impact with the ground can be related to the mussel’s drop height and its shell length. The graphs in Figures 1 to 4 show the relationships between the size, impact speed, and drop height of mussels. The figures are based on the results of extensive mussel dropping experiments that attempted to simulate real conditions.

Assume that all mussels referred to in the following questions are described by these relationships.
43 An 80 gram mussel has a shell area closest to

A 20 square centimetres.
B 24 square centimetres.
C 40 square centimetres.
D 45 square centimetres.

44 Which one of the following is the smallest drop height required to fracture three mussels with lengths 75 millimetres, 85 millimetres, and 100 millimetres, when all three are dropped onto wet beach sand?

A 1.90 metres
B 2.35 metres
C 2.67 metres
D 3.00 metres
Two mussels are dropped from a height of 2.5 metres onto wet beach sand. Mussel X has a mass of 30 grams and mussel Y has a mass of 60 grams.

According to the available evidence,
A only mussel X will fracture.
B only mussel Y will fracture.
C both mussels will fracture.
D neither mussel will fracture.

For a group of mussels, all of which have a shell length of 80 millimetres, the difference between the drop heights required to fracture the mussels when they drop onto rock and wet beach sand is closest to
A 0.6 metres.
B 1.0 metres.
C 1.9 metres.
D 2.5 metres.

Which of the following is closest to the lowest impact speed required to fracture a 30 gram mussel by impact with wet beach sand?
A 5.5 metres per second
B 6.8 metres per second
C 8.4 metres per second
D 10 metres per second
UNIT 13

Questions 48 and 49

The figure shows the corn crop yields expected under different conditions of rainfall and temperature, compared to the standard yield (100%). The standard yield occurs for conditions corresponding to the 100 contour line. The [0, 0] point on the figure indicates normal temperature and rainfall conditions.

For example, the 40 contour line shows the combinations of temperature and rainfall under which yields are expected to be 40% of the standard yield. One set of conditions in which this could occur is when temperature is normal but rainfall drops to around 50% of normal.

- Answer all questions with regard only to the temperature and rainfall ranges shown.

48 Crop yields are reduced from the standard yield by almost any
   A increase in rainfall.
   B increase in temperature.
   C decrease in rainfall.
   D decrease in temperature.

49 What is the change in crop yield from the standard yield with a 20% increase in rainfall and a 5 °C increase in temperature?
   A 10% increase
   B 20% decrease
   C 80% decrease
   D no change
Questions 50 – 52

A pedometer is a device that records the number of steps a person takes. This information, together with the length of the person’s step, can be used to determine the distance they walk or run. Furthermore, it can give an estimate of the energy expenditure (in kilojoules, kJ) due to the activity.

A number of people took part in a competition in which they walked or ran for a number of days. The table gives information for six of the participants at the end of Day 2 of the competition.

Assume that:
- walking uses 15 kJ of energy per kilogram of body mass per hour; and
- running uses 30 kJ of energy per kilogram of body mass per hour.

<table>
<thead>
<tr>
<th></th>
<th>Number of steps recorded by pedometer</th>
<th>Average step length (m)</th>
<th>Distance covered (km)</th>
<th>Body mass (kg)</th>
<th>Total energy used (kJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adele</td>
<td>5000</td>
<td>0.40</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Beau</td>
<td>3000</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celine</td>
<td></td>
<td>0.60</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dale</td>
<td></td>
<td>0.75</td>
<td>4</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Ellen</td>
<td></td>
<td>0.40</td>
<td>4</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Greg</td>
<td>1.20</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

50 By the end of Day 2, compared to Adele, the distance that Beau walked was

A 5% less.
B 5% greater.
C 10% less.
D 10% greater.

51 For the first two days of the competition Greg ran at an average speed of 15 km/h. What further information (i.e. information not given in the table and not able to be calculated from the information provided) is needed to determine Greg’s energy expenditure due to running?

A his mass only
B his mass and the number of steps he took only
C his mass and the duration of his run each day only
D his mass, the number of steps he took and the duration of his run each day

52 Another participant, Fran, ran for one hour on Day 1. On Day 2, she walked the same distance. Her running speed was twice her walking speed and her mass did not change during this time. How did Fran’s energy expenditure on Day 1 compare to that on Day 2?

A It was higher on Day 1.
B It was higher on Day 2.
C It was the same on both days.
D There is insufficient information to determine this.

UNIT 15

Questions 53–55

A triangular pile is a stack constructed from equal-sized balls. It has a triangular base (first layer) and a single ball in its top-most layer. The number of layers depends on the total number of balls used. For example, the triangular pile shown below has three horizontal layers with six balls in the first layer, three balls in the second layer and one ball in the third layer.

![Triangular Pile Diagram]

53 Which one of the following could be the number of balls in the base of a triangular pile?

A 16  
B 28  
C 44  
D 52

54 The number of balls along a side of the base of a triangular pile with 36 balls in its first layer is

A 6  
B 7  
C 8  
D 9

55 If the number of balls along a side of the base of a triangular pile is \( n \), then the number of layers in the pile is

A \( 2n - 3 \)  
B \( 3(n - 2) \)  
C \( n - 1 \)  
D \( n \)
UNIT 16

Questions 56–58

When fighting forest fires, a major problem for firefighters is dealing with the heat. Heat enters, leaves or is produced in a firefighter’s body by the following processes:

I radiation — heat from the fire and the sun radiate to the firefighter’s body
II conduction/convection — body heat is carried away by the surrounding air
III metabolism — heat is produced in the firefighter’s body
IV evaporation of sweat — heat is removed from the firefighter’s body when sweat evaporates from skin and clothing

In a study of heat balance in firefighters, two groups of firefighters built a firebreak — a hard physical task. One group did so next to a fire. The other group did exactly the same work under the same conditions except that no fire was burning nearby. The table gives the average results for the firefighters in the two groups.

<table>
<thead>
<tr>
<th>Process</th>
<th>Amount of heat gained or lost per minute by the body</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fire nearby</td>
</tr>
<tr>
<td>Radiation</td>
<td>gain of 260 joule</td>
</tr>
<tr>
<td>Conduction/convection</td>
<td>loss of 60 joule</td>
</tr>
<tr>
<td>Metabolism</td>
<td>gain of 488 joule</td>
</tr>
<tr>
<td>Evaporation of sweat</td>
<td>loss of 688 joule</td>
</tr>
<tr>
<td></td>
<td>no fire nearby</td>
</tr>
<tr>
<td>Radiation</td>
<td>gain of 51 joule</td>
</tr>
<tr>
<td>Conduction/convection</td>
<td>loss of 80 joule</td>
</tr>
<tr>
<td>Metabolism</td>
<td>gain of 561 joule</td>
</tr>
<tr>
<td>Evaporation of sweat</td>
<td>?</td>
</tr>
</tbody>
</table>

Assume that the figures given apply to any individual firefighter.

Although some of the processes can transfer heat to or from a firefighter, this unit and the table refer to net gains or losses of heat by each process.
56 When building a firebreak, the body of a firefighter

A loses heat by radiation and gains heat by conduction/convection.
B loses heat by both radiation and by conduction/convection.
C gains heat by radiation and loses heat by conduction/convection.
D gains heat by both radiation and by conduction/convection.

57 The heat lost by evaporation of sweat from the body of a firefighter in one minute while building a firebreak without a fire nearby is

A 532 joule.
B 590 joule.
C 612 joule.
D 688 joule.

58 Which one of the following increases when a firefighter moves from an area where there is no fire nearby to an area where there is a fire nearby?

A the amount of heat produced per minute by metabolism
B the amount of heat lost per minute by conduction/convection
C the amount of heat lost per minute by the evaporation of sweat
D none of A or B or C
Questions 59 – 62

When designing work desks it is important to consider people’s standing height because it is related to their optimal (i.e. most suitable) seat height and desk height.

Figure 1 presents information about the optimal seat heights and desk heights for typical men and women of various standing heights. For a person of a given height, optimal seat and desk heights can be obtained by ruling a horizontal line across the figure from their standing height value. For example, a typical 1700 mm tall person has an optimal seat height of 430 mm and an optimal desk height of close to 705 mm.

The figure also gives percentile information for heights of typical men and women. For example, 95.0% of typical men have a standing height less than, or equal to, 1860 mm and an optimal seat height less than, or equal to, 470 mm. 50.0% of typical men have a standing height less than, or equal to, 1740 mm and an optimal seat height less than, or equal to, 440 mm.

• For the population represented in Figure 1, assume there are equal numbers of men and women.
59 What percentage of males have an optimal seat height between 470 mm and 440 mm?

A 2.5%
B 5%
C 25%
D 45%

60 A company employs a new person who is 1660 mm tall.

The person’s seat height should be adjusted to

A 420 mm irrespective of whether they are male or female.
B 420 mm if they are male but less than this if they are female.
C any height between 370 and 480 mm because people vary so much.
D any height between 380 and 470 mm because this range covers most people.

61 Which one of the following seat height ranges would suit the greatest number of people?

A 440–480 mm
B 430–450 mm
C 405–440 mm
D 370–410 mm

62 Which of the following best describes the relationship between change in standing height and change in optimal seat and desk heights?

For each 100 mm increase in standing height,

A seat height increases by 30 mm and desk height increases by 25 mm.
B seat height increases by 25 mm and desk height increases by 30 mm.
C seat height increases by 25 mm and desk height increases by 25 mm.
D seat height increases by 30 mm and desk height increases by 30 mm.
UNIT 18

Questions 63 and 64

The figure below accompanied an article in a magazine explaining the pungent (hot, spicy) effect of Indian mustard powder on nose and palate.

- Enzymes referred to in the figure are substances which control chemical reactions in living things.

63 The figure above indicates that uncrushed Indian mustard seed

A is pungent.
B contains allyl isothiocyanate.
C contains myrosinase and sinigrin.
D contains no enzymes.

64 Of the following, the best explanation for the pungency of Indian mustard powder is that crushing the seed

A breaks down allyl glucosinolate into mustard meal.
B causes the enzyme myrosinase to turn into the pungent substance allyl isothiocyanate.
C brings myrosinase and sinigrin together to produce the pungent substance allyl isothiocyanate when water is added.
D causes the enzyme myrosinase to produce sinigrin, which then turns into the pungent substance allyl isothiocyanate.
UNIT 19

Questions 65 and 66

In the grid below, the letters represent different whole numbers of less than 20. The numbers to the right and below the grid are row and column totals.

For example, $Q + L + Z + Z = 46$.

<table>
<thead>
<tr>
<th></th>
<th>Q</th>
<th>L</th>
<th>Z</th>
<th>Z</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>K</td>
<td>K</td>
<td>Q</td>
<td>Q</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>K</td>
<td>Z</td>
<td>L</td>
<td>Q</td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

30  38  X   Y

65 The value of Q is

A  7.
B  9.
C  11.
D  13.

66 The value of X is

A  40.
B  42.
C  44.
D  46.
UNIT 20

Questions 67 – 70

Attached to Runalong Fire Station there are seven firefighters (1, 2, 3, 4, 5, 6, 7). It is necessary to have three firefighters at the station each night in case of emergency, and the Firefighters’ Union requires that each firefighter works the same number of nights.

Schedules I–IV were prepared for consideration.

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>{1,2,4}</td>
<td>{1,2,4}</td>
<td>{1,2,4}</td>
<td>{1,2,4}</td>
</tr>
<tr>
<td>Monday</td>
<td>{2,3,5}</td>
<td>{2,3,5}</td>
<td>{2,3,5}</td>
<td>{2,3,5}</td>
</tr>
<tr>
<td>Tuesday</td>
<td>{3,4,6}</td>
<td>{3,4,6}</td>
<td>{3,4,6}</td>
<td>{3,4,6}</td>
</tr>
<tr>
<td>Wednesday</td>
<td>{4,5,7}</td>
<td>{4,5,7}</td>
<td>{1,2,4}</td>
<td>{4,5,7}</td>
</tr>
<tr>
<td>Thursday</td>
<td>{1,2,4}</td>
<td>{5,6,1}</td>
<td>{5,6,1}</td>
<td>{5,6,1}</td>
</tr>
<tr>
<td>Friday</td>
<td>{2,3,5}</td>
<td>{6,7,2}</td>
<td>{6,7,2}</td>
<td>{7,1,2}</td>
</tr>
<tr>
<td>Saturday</td>
<td>{3,4,6}</td>
<td>{7,1,3}</td>
<td>{7,1,3}</td>
<td>{6,1,3}</td>
</tr>
</tbody>
</table>

67 Which one of the schedules meets the requirements of the Firefighters’ Union?
A I C III
B II D IV

Questions 68 – 70 refer to the following additional information:

A schedule can be thought of as a set of v objects (in this case, firefighters) that have to be arranged into b sets (in this case, one set for each day of the week) all of size k and such that each object occurs the same number of times (r) in the schedule and only once in any set. For the firefighters’ schedules, v = 7, b = 7, k = 3, and r = 3.

68 If v = 3, b = 6, k = 1, r = 2, which one of the following completes the schedule {1}, {2}, {3}, {1}, {2}, . . .?
A {1} C {3}
B {2} D neither {1}, nor {2} nor {3}

69 The schedule {1,2}, {2,3}, {x,y} is a schedule for which v = 3, b = 3, k = 2, r = 2, if
A x = 1, y = 2 .
B x = 1, y = 3 .
C x = 2, y = 2 .
D x = 2, y = 3 .

70 The schedule
\{1,2,3\} \{4,5,6\} \{7,8,9\} \{1,4,7\}
\{2,5,8\} \{3,6,9\} \{1,5,9\} \{2,6,7\}
\{3,4,8\} \{1,6,8\} \{2,4,9\} \{x,y,z\}

is a schedule for which v = 9, b = 12, k = 3, r = 4, if
A x = 1, y = 2, z = 4 .
B x = 1, y = 3, z = 5 .
C x = 2, y = 4, z = 6 .
D x = 3, y = 5, z = 7 .
# ANSWERS

| Unit 1: El Nino | 1 | D  |
| 2 | D  |
| 3 | B  |
| 4 | D  |
| 5 | C  |

| Unit 2: Statements | 6 | A  |
| 7 | B  |
| 8 | A  |
| 9 | C  |

| Unit 3: Compulsory Education | 10 | D |
| 11 | C |

| Unit 4: Car Pool | 12 | D |
| 13 | B |
| 14 | C |

| Unit 5: Photography | 15 | D |
| 16 | A |
| 17 | C |
| 18 | B |
| 19 | C |

| Unit 6: The Great Gatsby | 20 | C |
| 21 | D |
| 22 | C |
| 23 | A |
| 24 | D |

| Unit 7: Middlemarch | 25 | B |
| 26 | C |
| 27 | A |
| 28 | A |
| 29 | B |
| 30 | D |
| 31 | A |

| Unit 8: War Poems | 32 | B |
| 33 | B |
| 34 | B |
| 35 | A |

| Unit 10: Freshwater animals | 36 | C |
| 37 | A |
| 38 | A |

| Unit 11: Burger index | 39 | B |
| 40 | C |
| 41 | A |
| 42 | C |

| Unit 12: Mussels | 43 | C |
| 44 | C |
| 45 | B |
| 46 | A |
| 47 | B |

| Unit 13: Corn crop yield | 48 | C |
| 49 | B |

| Unit 14: Pedometers | 50 | B |
| 51 | A |
| 52 | C |

| Unit 15: Triangular Pile | 53 | B |
| 54 | C |
| 55 | D |

| Unit 16: Firefighters | 56 | C |
| 57 | A |
| 58 | C |

| Unit 17: Seat height | 59 | D |
| 60 | A |
| 61 | C |
| 62 | B |

| Unit 18: Mustard | 63 | C |
| 64 | C |

| Unit 19: Grid | 65 | B |
| 66 | A |

| Unit 20: Runalong fire station | 67 | B |
| 68 | C |
| 69 | B |
| 70 | D |
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