

# MSAP Ireland

*Mature Students Admissions Pathway*

## Information Booklet

Includes valuable advice on how to prepare and some sample questions

A full Practice Test booklet is available for purchase from the MSAP website

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**Contact us:**

The MSAP Office prefers communication by email  
MSAP Ireland Office: [msap-ireland@acer.org](mailto:msap-ireland@acer.org)

# Before Test Day

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## Admission Ticket

Candidates receive an email from the MSAP Office to confirm the availability of their Admission Ticket.

Admission Tickets are accessed by logging into the ACER User Account created when booking the MSAP test.

Candidates need their username (email address) and password to log in. If any issues are encountered in accessing the Admission Ticket, please contact the MSAP Office before the test day.

You must have your Admission Ticket at the test sitting (digital or printed).

**Your Admission Ticket contains important details, including your username to access your online MSAP test.** You will be required to show this ticket prior to your test session being activated by the proctor. Please note, your Admission Ticket should have your details printed on it. If they do not display in the printed copy, check that Javascript is enabled (See how: <http://www.enable-javascript.com>).

## Identification

On the day of the test you are required to present ONE original photo-bearing identification document.

**IMPORTANT: Garda ID and Student cards are not accepted as identification.**

**Photocopies of identity documents and expired documents are not acceptable.**

**The only acceptable identification documents are:**

- A valid passport, **or**
- A current EU/EEA National Identity Card, **or**
- A current photo-bearing driver licence (learner's permit, probationary or full licence), **or**
- An Irish Public Services Card (in combination with another form of ID containing date of birth), **or if you have none of the above documents,**
- A certified letter of identification.
  - This letter must be on official institution letterhead (eg school, employer, doctor, Garda, etc.)
  - It should contain your full name, date of birth and a passport-sized photo of you glued to the letter
  - The institution's stamp must overlap the photo
  - The official verifying the identification must include their signature and title
  - A witness to the official's signature is required
  - Your signature is required

If you need to provide a certified letter of identification, please organise this **well before the test date**. If it does not conform to the criteria described above, you may not be allowed to sit your test.

**If you do not present one of the above approved identification documents, in addition to your Admission Ticket, you will not be able to sit MSAP.**

# On Test Day

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## Timing

Please download and read the MSAP Online Testing Step-by-Step Guide from the “Book Test” section of the website for information on how to book, schedule and be ready for your online test. This is essential reading.

You should be logged in to your ProctorU account and ready to sit your test at least 5 minutes before your scheduled test session(s).

Pre-test procedures can take around **30 minutes to one hour** (this does not count towards your test time). Your test will take 2–3 hours depending on the modules you need to sit.

## What to Bring

- your MSAP Admission Ticket (digital or printed)
- one form of an approved photo-bearing identity document
- a pen/pencil
- two sheets of blank paper for rough working (optional).

Bottled water is permitted.

We strongly recommend to please EAT A MEAL and visit the toilet before your test, as you will be occupied for a number of hours and no food is permitted without prior consent.

## Prohibited Items

**Use of unauthorised aids is prohibited, including but not limited to:**

- Audio or video recording with or without earphones
- Mobile phones or other communication devices other than your computer to sit the test
- Smart glasses
- Smart watches
- Calculators
- Dictionaries of any type
- Food (unless permission is granted by the MSAP-Ireland Office based on medical grounds)
- Notes or books
- Stationery items other than pens or pencils and two sheets of blank paper
- Pets
- Headphones or earbuds
- Certain programs (TeamViewer and VNC) are not to be open on your computer during the test. For details, please see website section on prohibited items.

## Misconduct

MSAP Ireland is a high-stakes test; the results of the test have the potential to make a major impact on the future career of the test taker. For this reason, ACER has established security procedures which will be strictly enforced at all times. The giving of false or misleading information during the registration process, and any form of cheating during the test itself, are viewed as serious breaches of ethical behaviour and will attract penalties. Any candidate found to be cheating will automatically have their MSAP Ireland results cancelled and may be prohibited from registering to take MSAP Ireland on a future occasion.

Candidates are expected to abide by the test rules and to follow the instructions of the remote proctors at all times. You are asked to respect the rights of test remote proctoring staff and ACER staff.

Please be aware that if you act in a manner that is intentionally offensive or abusive during your test session, or in your verbal or written communications with ACER or other remote proctoring staff before, during or after the test, or if you engage in any acts listed unacceptable behaviour or misconduct, you will be reported and subject to the **consequences** listed below.

### Examples of unacceptable behaviour include, but are not limited to:

- emotional, psychological or physical violence or abuse
- bullying
- sexual harassment
- racial and religious vilification
- aggressive/abusive behaviour
- unreasonable demands and undue persistence.

Behaving in an unacceptable manner will be considered an act of misconduct and subject to the **consequences** listed below.

### Misconduct for the test includes:

- Breach of any of the security arrangements for the test.
- Impersonation (attempting to take the test on behalf of another person or have another person take the test for you).
- Attempting to copy or memorise all or part of the test.
- Failure to follow the instructions of the remote proctor at all times.

- Receiving assistance during the test.
- Sharing of test content after the test.
- Being found with or attempting to use prohibited aids (e.g. notes, dictionary, calculator, mobile phone, smart glasses, smart watches or any device capable of audio or video recording etc.).
- Talking aloud (unless it is to ask the remote proctor a question) during the test session.
- Leaving the test room without permission.
- Using the test questions, their content or information about them for purposes other than your sitting of the test.
- Publishing the test questions or any of their content or information about them on the internet, any digital format or otherwise; and/or passing the test questions, any of their content or information about them to third parties.
- Giving false or misleading information.
- Infringement of copyright. Copyright infringement includes: performing those rights or authorising the performance of those rights which are granted at law exclusively to the copyright owner. These rights include the exclusive right to reproduce the copyright work in a material form and to communicate that work to the public.
- In any way breaching (as determined by ACER in its absolute discretion) any of the terms and conditions of your registration to participate in the test.
- Any negligent, unlawful or wilful act or omission by you which ACER, in its absolute discretion, renders you to be unfit to participate in the test, whether or not you are registered to participate at the time of ACER's determination.

All acts of suspected misconduct by candidates will be reported by the remote proctors to ACER.

**Consequences** for misconduct include cancelling your registration and/or disqualification to sit the test in future, and the withholding of your test results.

It is also possible that the misconduct will be referred to one or more educational institutions.

CANDIDATES ARE PUT ON NOTICE that except as expressly provided at law, there is no right to challenge, appeal or seek review of any determination by ACER that misconduct has occurred or in relation to any consequences imposed by ACER for any misconduct.

# After Test Day

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## Results

Your result notification is sent to the same email address you used to register for the test and to receive your test Admission Ticket.

Your email address is very important, so we recommend you register using an address that you use often and that is secure. If you use a Hotmail or Yahoo address please put the MSAP email address into your address book so your email provider will accept the email.

Results are available to candidates some weeks after the test. You should print out a copy of your results for your own records.

Universities will have electronic access to MSAP test results after the test sitting.

If you change your email address, please login to your ACER User Account and update your account details immediately, so that we can send your result notification email to the correct email address.

Candidates receive results for all modules of the MSAP test attempted. MSAP results are reported as scale scores on a range usually between 50 and 150, with a mean score of 100. The MSAP scale scores reflect the differing abilities of the candidates and different degrees of difficulty of the test items.

Percentile ranks are provided to help make sense of the scaled scores, and indicate the percentage of candidates receiving scores below a certain score. For example, if a score of 117 has a percentile of 80, it means that a candidate who achieves a score of 117 has a higher

result than 80% of the candidate population (i.e. they are in the top 20% of the candidate population).

An Overall MSAP score is also reported. Results from Module 1 and the multiple choice modules are averaged.

Candidates who sit for Module 1 and Module 2 receive an MSAP Arts/Humanities Overall score.

Candidates who sit for Module 1 and Module 3 receive an MSAP Maths/Sciences Overall score.

Candidates who sit for Modules 1, 2 and 3 receive two separate Overall scores: an MSAP Arts/Humanities Overall score, and an MSAP Maths/Sciences Overall score.

## Appeals

ACER will not enter into appeals against MSAP test results. Candidates are advised that MSAP test results are released only after careful calculation and extensive checking. Requests for remarking will not be considered.

Should you have any complaint about a particular question on the day of the test, you must alert the supervisor to your concern and submit a written note before you leave the test centre. Your complaint will be reviewed and you will be notified of the outcome. Similarly, any complaints relating to the testing venue or physical discomfort suffered should be reported to the supervisor on the day, or by email to the MSAP Office within seven days of the test administration.

It is not possible to give special consideration for impaired performance on the day of the test caused by unexpected or minor illness or misadventure.

# Preparing for the MSAP test

This Information Booklet is designed to help you prepare for the Mature Students Admissions Pathway (MSAP) test. **Each institution determines which test modules you must sit, depending on the course(s) for which you're applying.**

## **MSAP Test Modules**

- **Module 1:** Written English (two short essays, 1 hour)
- **Module 2:** Reasoning in the Humanities and Social Sciences (multiple-choice, 1 hour)
- **Module 3:** Reasoning in the Sciences, Mathematics and Social Sciences (multiple-choice, 1 hour)

The questions in this booklet are indicative of the types of questions encountered in the real test.

Additional practice material is available for purchase from the MSAP website under the 'Prepare' section.

MSAP is an aptitude test so there is no specific subject matter to learn, nor do the questions fall into patterns that can be learned as drills.

However, there is value in becoming familiar with the style of questions you will encounter in the test, and there is also value in rehearsing some strategies to enhance your time management.

## **Module 1 – Written English**

The Test Developers have written some valuable general advice about how to approach the Written English tasks. A set of sample writing prompts is also provided for you to attempt.

Time management is an important part of doing well in the test, so practising producing two coherent pieces of writing within 1 hour is important. Most MSAP candidates have probably not written 'essays' in recent years, but other writing you have been doing (blogs, letters, reports at work, etc.) will stand you in good stead.

Complete at least one practice test in an uninterrupted hour, then reflect on what you have written in light of the advice and criteria provided in this booklet.

## **Module 2 – Reasoning in the Humanities and Social Sciences (multiple-choice); and**

## **Module 3 – Reasoning in the Sciences, Mathematics and Social Sciences (multiple-choice)**

The following comments apply generally to the multiple-choice modules of the test.

### ***Time management strategies***

Each multiple-choice module of the test takes one hour.

Aim to **finish working a few minutes ahead** of the allocated time to review what you've done.

**Break your time into blocks** to monitor your progress. Aim to finish the 35 questions in Module 2 (or 3) within 55 minutes (20 questions in the first 30 minutes, 15 questions in the next 25 minutes). This will give you five minutes spare at the end to revisit and check your answers.

It is very important to **finish the test and record an answer for every question.**

Completing a timed test online is an unfamiliar experience for most MSAP candidates. Therefore, practising reading and thinking against the time pressure of a full test is a good idea.

A method many people use is to review the free sample questions in this booklet, checking the answers as they go, becoming familiar with the style of questions, then use the Practice Test (available for purchase on the MSAP website) as a **timed practice test**. This involves putting aside a block of uninterrupted time. Turn the tv and phone off, send other household members out, sit in an upright chair at the table, have a clock as a timer, and do the test.

- Fill in the Answer Sheet demographic information for practice. You will be given time on the test day to fill this in before the test begins.
- Give yourself 1 minute to check the test (not the answers at the back!)
- Complete Module 2 or 3 (35 questions) in one hour, using the Answer Sheet.

This may not be a perfect experience for you, but is good preparation for test day.

## **Annotated Answers**

Managing the timing is one thing, but actually working out the correct answers is another.

Practice Test 1 has the answers listed at the back, but there is also a section of annotated answers. Test Developers have written examples of how to work out the correct answers, and the reasoning behind them.

Sometimes there's more than one way to arrive at the answer, but only one method is described for each question in the Practice Test booklet. The writers have usually tried to explain how the correct answer has addressed all parts of the question, and why the other options are incorrect

## **The Online Experience**

To become familiar with the online format we suggest you try Practice Tests 2–4 (depending on which modules you are required to sit).

### **TIME**

**Build in Reviewing Time**

**Blocks of Time during the test**

**Pace time to finish the test**

**Timed practice test**





# MODULE I – WRITTEN ENGLISH

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## Advice to Candidates

The purpose of MSAP Written English (Module I) is to assess your ability to communicate effectively in writing. The following three aspects of your writing are taken into account in making an overall judgement:

- Thought and content
- Structure and organisation
- Expression, style and mechanics.

These different aspects are not considered separately. Markers read a script for its overall, holistic impression.

## The tasks

You are to respond to a *Task A* theme that offers a set of four comments, and a *Task B* theme that has a set of four comments. The Tasks are only slightly different in focus, and do not require different kinds of responses.

Make sure you actually respond to and deal with your chosen topic.

Themes are selected to:

- be broad and generally accessible to candidates;
- not offer advantage to particular candidates;
- give room for candidates to respond in different ways or develop a response in different directions;
- not be provocative or sensational; and
- be likely to hold some interest for candidates.

Themes will be bland rather than provocative. The challenge for a candidate is to find something to say that is **not** bland and obvious in response, and that they feel is worth saying.

The set of comments offer different perspectives on a theme. You do not have to agree with any of the comments. *It may be a good strategy to challenge and argue against a comment if you think it unreasonable.*

You may discuss a comment in an impersonal way, or you may deal with it in quite personal terms. You need not pretend to have knowledge of an issue and a breadth of vision and experience you do not have. You can deal with an issue from a quite personal point of view. Even so, some of the best candidates distinguish themselves for their breadth of vision.

You may make a formal argument, or you may analyse and reflect on the nature of a theme without drawing a definite conclusion. You could present an anecdote or personal experience. You might even tell a fictional story. Whatever you do, it will be judged in terms of your ability to present a definite and sophisticated point of view.

## The essay form

What you are writing might be loosely called 'an essay'; that is an attempt to think about an issue. The markers do **not** expect that such an essay should have a strict form and have a definite structure. Some people learn the 3 or 5 paragraph essay form. This model has an introduction, 3 or 5 main supporting points in separate paragraphs, and a conclusion. Such a model can give a structure to what you say, but it can seem rather rigid and formulaic ('In the essay I am going to ... In this essay I have ...'). The crucial issue is whether the ideas you present are organised and build on each other. It is important to start at the beginning and to build towards a conclusion. There is no reason why the conclusion shouldn't only become clear during or even at the end of the piece, for instance. There is no reason why the conclusion should be stated in the introduction and then repeated at the end.

## Writing in test conditions

As the test is impromptu, first-draft writing, markers do not expect it to be flawless. Some candidates can begin writing without knowing how they will end, but for most candidates it is best to have some kind of plan. The plan may be no more than a couple of words, but it will help most candidates to work out in advance where they want to go and how they want to get there.

Candidates sometimes misinterpret the Written English test as primarily an exercise in correct use of English. Using English correctly is an advantage in this writing test as it eases communication with the reader, and mistakes do not distract from what you are saying. Don't be unduly concerned about incorrect expression or spelling. Focus on communicating effectively with the reader. You are better off trying to express yourself freely than worrying too much about avoiding mistakes in expression and spelling.

## The use of time

There is 5 minutes reading and thinking time for Written English, and two pieces to write in 30 minutes each. The two pieces are marked separately, and it is important to use the hour of writing time effectively. It is a very bad idea to use too much time on one task then not be able to do justice to the other. A good performance on one task will not make up for a poor performance on the other.

It is good to give a piece of writing an organised shape in the time available, but getting the whole thing complete is not a crucial issue. Give your piece of writing a title that will orient the reader to the direction you are going.

## A selective focus rather than vague and general

It is important to try to find something definite that you think is worth saying. Don't try to say everything you can think of. Try to be selective and focused. It is better to say one thing well than to try to cover everything you can think of in a superficial way. It is better to focus on something definite and distinctive, and it may be better to avoid the obvious points that everyone will make. Hundreds of other candidates are writing on the same theme as you, and you want to stand out.

On the other hand, don't try to stand out by being extravagant or outrageous. You need to be balanced, reasonable and thoughtful. Try as best you can to be frank about what you think and feel, but you can't say anything you like. The reader is going to make a judgement about the soundness, reasonableness and maturity of what you say, and grade your script accordingly. Don't try to be merely provocative. You must write to show that you are aware of community standards, even if you don't agree with them. Markers will try to read your writing with pluralistic tolerance, and they won't be basing their judgement on whether they agree with you or not about the theme. They will be judging your writing on the sophistication and reasonableness of the support and justification you offer for your views.

### What the markers say ...

- Back up your opinions with argument, evidence and examples (e.g. use personal anecdote and bed it into a wider discussion).
- Be prepared to argue the opposite side to the topic. You may be able to display your thinking processes by thinking of critical arguments and counter examples.
- Explore ideas in some depth and complexity.
- Don't spend a lot of time defining words – assume the marker knows the meaning of words such as 'heroes', 'charity', etc.
- Read comments carefully – be alert to specific terms. Address the whole comment you choose, not just part of it.
- Don't just parrot the comments in the title, or worse still, in the opening sentence.
- Don't spend the introduction explaining what you're going to do.

# Sample Topics for MSAP Module 1 – Written English

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## 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 – 4

*In this passage from an essay, F. Scott Fitzgerald, whose fiction is connected to the prosperity and extravagance of New York in the 1920s, has come back from overseas at the onset of the Great Depression of the 1930s. Alfred E. Smith was the president of the corporation that built and operated the Empire State Building.*

In the dark autumn of two years later we saw New York again. We passed through curiously polite customs agents, and then with bowed head and hat in hand I walked reverently through the echoing tomb. Among the ruins a few childish wraiths still played to keep up the pretense that they were alive, betraying by their feverish voices and hectic cheeks the thinness of the masquerade. Cocktail parties, a last hollow survival from the days of carnival, echoed to the 5  
plaints of the wounded: ‘Shoot me, for the love of God, someone shoot me!’, and the groans and wails of the dying: ‘Did you see that United States Steel is down three more points?’ My barber was back at work in his shop; again the head waiters bowed people to their tables, if there were people to be bowed. From the ruins, lonely and inexplicable as the sphinx, rose the Empire State Building and, just as it had been a tradition of mine to climb to the Plaza 10  
Roof to take leave of the beautiful city, extending as far as eyes could reach, so now I went to the roof of the last and most magnificent of towers. Then I understood – everything was explained: I had discovered the crowning error of the city, its Pandora’s box. Full of vaunting pride the New Yorker had climbed here and seen with dismay what he had never suspected, that the city was not the endless succession of canyons that he had supposed but that it *had* 15  
*limits* – from the tallest structure he saw for the first time that it faded out into the country on all sides, into an expanse of green and blue that alone was limitless. And with the awful realization that New York was a city after all and not a universe, the whole shining edifice that he had reared in his imagination came crashing to the ground. That was the rash gift of Alfred E. Smith to the citizens of New York. 20

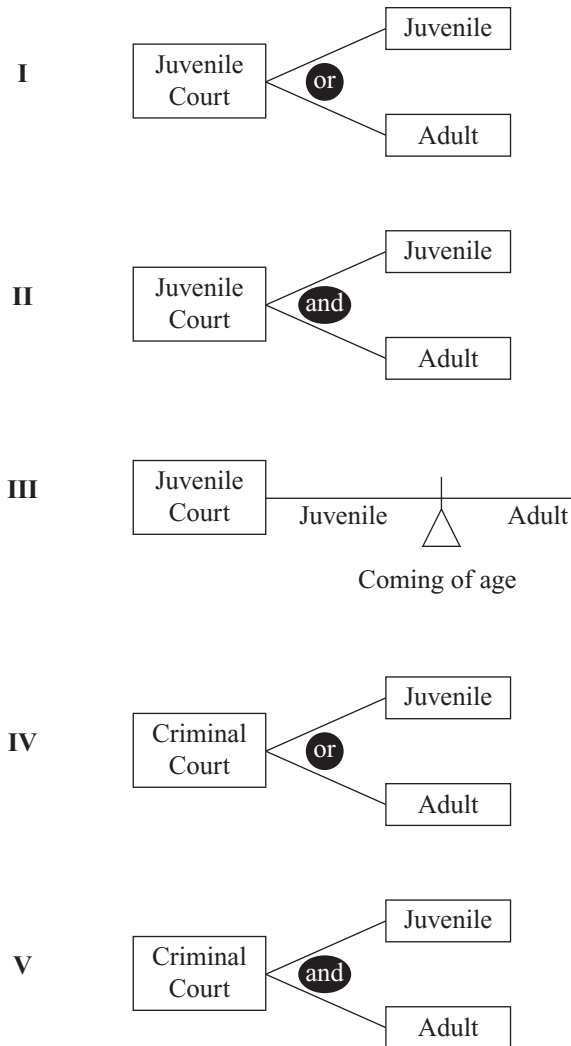
- 1 The passage implies that the customs agents (line 2) and the head waiters (line 8) in earlier times had
- A had more prestigious jobs.
  - B been warmer and less formal.
  - C been less concerned about their jobs.
  - D been more anxious to please customers.

- 2 The word 'childish' in line 3 indicates that some people have not
- A come to terms with the gravity of their situation.
  - B understood that they need not repeat their mistakes.
  - C been adult enough to avoid the disaster in the first place.
  - D shown the selflessness required to help others in the same position.
- 3 For Fitzgerald, New York's demise was a result of a lack of
- A restraint.
  - B compassion.
  - C urban planning.
  - D economic planning.
- 4 In his picture of New York, Fitzgerald suggests that, for New Yorkers, the Great Depression began when
- A New York began to overflow its geographical limits.
  - B they understood that New York was a part of the world.
  - C New York had no further ambition to strive for excellence.
  - D they began to believe they were better than the rest of the world.

## UNIT 2

### Questions 5 – 7

The following diagrams present overviews of how the legal systems of five different states in a certain country deal with trying and sanctioning juvenile offenders.



5 In which model would it be legally impossible for a juvenile to be incarcerated in an adult jail?

- A I
- B II
- C III
- D IV

- 6 Systems **I** and **II** differ significantly from systems **IV** and **V** in
- A whether or not the offenders can be considered adults for the purposes of their sanctions.
  - B whether offenders are considered as juveniles prior to sentencing or after sentencing.
  - C the severity with which juveniles are sanctioned.
  - D the choices available for sanctioning.
- 7 From the point of view of an offender, which of the following pairs would have a similar range of possible outcomes?
- A **I** and **V**
  - B **II** and **IV**
  - C **III** and **V**
  - D **I** and **IV**

### UNIT 3

#### Question 8

‘It is useless for the sheep to pass resolutions in favour of vegetarianism while the wolf remains of a different opinion.’

*Dean William Ing*

- 8 The quotation is mainly about
- A power.
  - B ideology.
  - C conformity.
  - D controversy.

## UNIT 4

### Questions 9 – 12

*The following passage is from the introduction to a series of lectures on philosophy written in the early 1900s.*

The history of philosophy is to a great extent that of a certain clash of human temperaments. Undignified as such a treatment may seem to some of my colleagues, I shall have to take account of this clash and explain a good many of the divergencies of philosophies by it. Of whatever temperament a professional philosopher is, he tries, when philosophising, to sink the fact of his temperament. Temperament is no conventionally recognised reason, so he urges impersonal reasons only for his conclusions. Yet his temperament really gives him a stronger bias than any of his more strictly objective premises. It loads the evidence for him one way or the other, making a more sentimental or more hard-hearted view of the universe, just as this fact or that principle would. He trusts his temperament. Wanting a universe that suits it, he believes in any representation of the universe that does suit it. He feels men of opposite temper to be out of key with the world's character, and in his heart considers them incompetent and 'not in it', in the philosophic business, even though they may far excel him in dialectical ability. 5

Yet in the forum he can make no claim, on the bare ground of his temperament, to superior discernment or authority. There arises thus a certain insincerity in our philosophic discussions: the potentest of all our premises is never mentioned. I am sure it would contribute to clearness if in these lectures we should break this rule and mention it, and I accordingly feel free to do so. 10 15

- 9 The passage implies that the writer's colleagues believe that philosophical argument is based on
- A disposition.
  - B trial and error.
  - C personal beliefs.
  - D objective principles.
- 10 The words 'a certain insincerity in our philosophic discussions' (lines 15 and 16) suggest that the writer thinks philosophers are often
- A prepared to lie to be convincing.
  - B aware that their arguments are illogical.
  - C unwilling to take into account the opinions of others.
  - D unwilling to acknowledge what influences their arguments.



- 11 The writer of the passage is most likely to agree with the idea that philosophical positions
- A are subjective.
  - B are devoid of emotion.
  - C must be universal and unchanging.
  - D must conform with facts about the outer world.
- 12 Which of the following best describes the language used in the passage?
- A arrogant
  - B hesitant and diffident
  - C sincere and measured
  - D belligerent and provocative

## UNIT 5

### Question 13

- 13 Which two of statements (i) – (iv) below are most similar to each other in the attitude to equality presented?
- (i) Although men possess unequal powers, they nonetheless deserve equal rights.
  - (ii) Men 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 men it harbours.
- A statements (i) and (iii)
  - B statements (ii) and (iii)
  - C statements (i) and (iv)
  - D statements (iii) and (iv)

# MSAP Module 3 –

## Reasoning in the Sciences, Mathematics and Social Sciences

### Sample multiple-choice questions

#### UNIT 1

##### Questions 1 – 5

Module  
2

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.

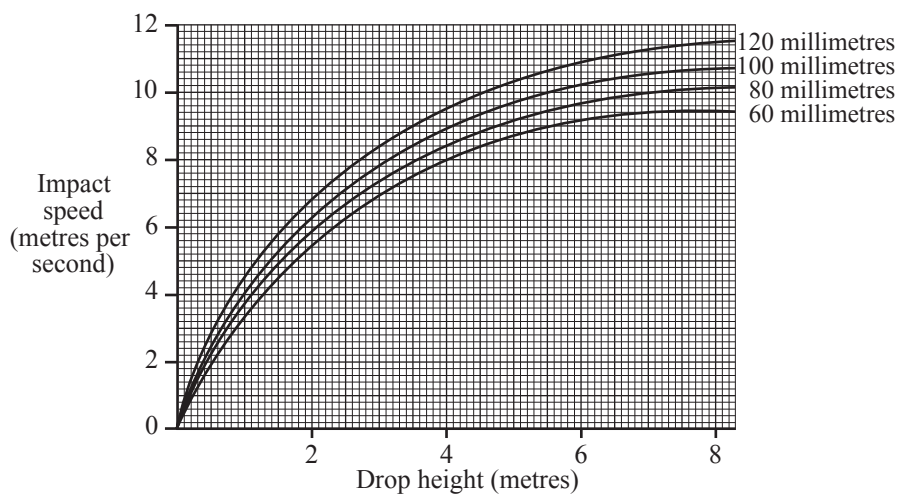


Figure 1

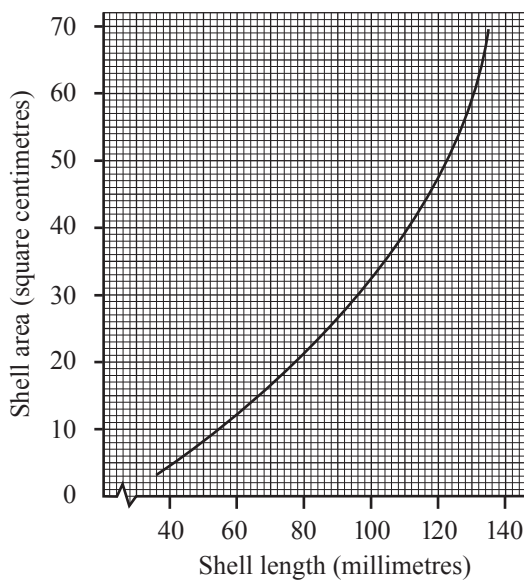


Figure 3

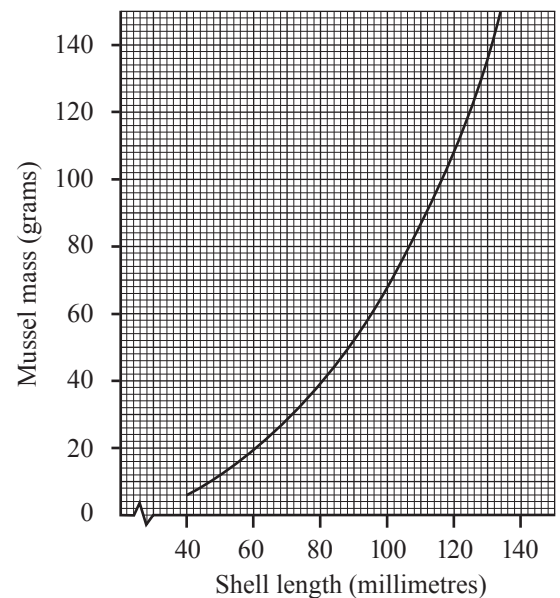


Figure 2

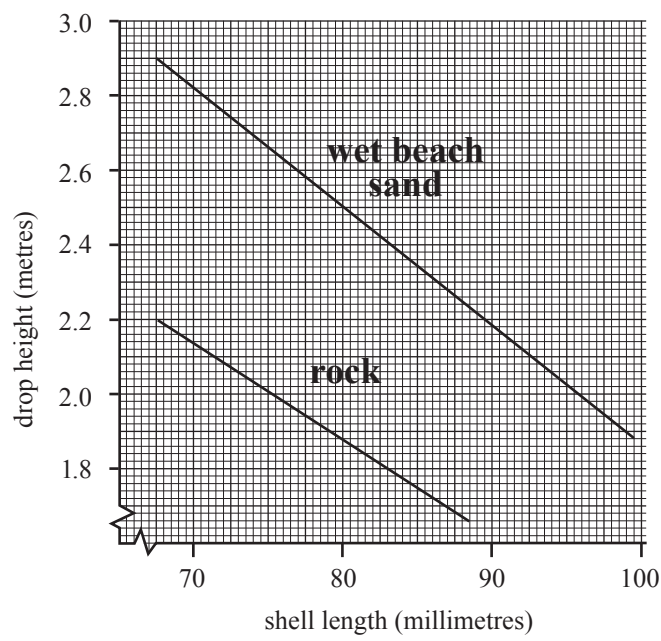


Figure 4

- 1 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.
  
- 2 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

- 3 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.
- 4 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.
- 5 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 2

### Questions 6 – 9

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.

	I	II	III	IV
Sunday	{1,2,4}	{1,2,4}	{1,2,4}	{1,2,4}
Monday	{2,3,5}	{2,3,5}	{2,3,5}	{2,3,5}
Tuesday	{3,4,6}	{3,4,6}	{3,4,6}	{3,4,6}
Wednesday	{4,5,7}	{4,5,7}	{1,2,4}	{4,5,7}
Thursday	{1,2,4}	{5,6,1}	{5,6,1}	{5,6,1}
Friday	{2,3,5}	{6,7,2}	{6,7,2}	{7,1,2}
Saturday	{3,4,6}	{7,1,3}	{7,1,3}	{6,1,3}

6 Which one of the schedules meets the requirements of the Firefighters' Union?

- |      |       |
|------|-------|
| A I  | C III |
| B II | D IV  |

Questions 10 – 12 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  $r = 3$ .

7 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} |

8 The schedule {1,2}, {2,3}, {x,y} is a schedule for which  $v = 3$ ,  $b = 3$ ,  $k = 2$ ,  $r = 2$ , if

- |                    |                    |
|--------------------|--------------------|
| A $x = 1, y = 2$ . | C $x = 2, y = 2$ . |
| B $x = 1, y = 3$ . | D $x = 2, y = 3$ . |

9 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 $x = 1, y = 2, z = 4$ . | C $x = 2, y = 4, z = 6$ . |
| B $x = 1, y = 3, z = 5$ . | D $x = 3, y = 5, z = 7$ . |

## UNIT 3

### Questions 10 – 12

When fighting bushfires, 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

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

- 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.

10 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.

- 11** 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.
- 12** 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

## ANSWERS

Module 2 – Reasoning in the Humanities and Social Sciences		
<b>Unit 1</b> Fitzgerald’s Lost City	1	<b>C</b>
	2	<b>A</b>
	3	<b>A</b>
	4	<b>B</b>
<b>Unit 2</b> Juvenile Court	5	<b>C</b>
	6	<b>B</b>
	7	<b>D</b>
<b>Unit 3</b> Wolf and Sheep Quote	8	<b>A</b>
<b>Unit 4</b> Philosophy and Temperament	9	<b>D</b>
	10	<b>D</b>
	11	<b>A</b>
	12	<b>C</b>
<b>Unit 5</b> Statements	13	<b>A</b>

Module 3 – Reasoning in the Sciences, Mathematics and Social Sciences		
<b>Unit 1</b> Mussels	1	<b>C</b>
	2	<b>C</b>
	3	<b>B</b>
	4	<b>A</b>
	5	<b>B</b>
<b>Unit 2</b> Runalong Fire Station	6	<b>B</b>
	7	<b>C</b>
	8	<b>B</b>
	9	<b>D</b>
<b>Unit 3</b> Firefighters	10	<b>C</b>
	11	<b>A</b>
	12	<b>C</b>

### ACKNOWLEDGMENTS

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South African Association for the Advancement of Science for the extract from ‘Musseldropping behaviour of kelp gulls’ by WR Seigfried in *South African Journal of Science*, Vol 73, Nov 1977; Budd, Graeme for the extract from ‘Safer bushfire fighting’, *Australasian Science*, Feb, 1998.