

MINI MOCK PAPER BIOMEDICAL ADMISSIONS TEST (BMAT)

MINI MOCK PAPER

BMAT

Mock Examination 1

BioMedical Admissions Test

Time Allowed: 2 hours

Instructions to Candidates

Please read this page carefully

Calculators and dictionaries may not be used during the examination.

SECTION 1: Aptitude and Skills (usually 1 hour & 35 questions. Incl. here are 3 questions)

SECTION 2: Scientific Knowledge and Applications (usually 30 MINUTES & ~ 30 questions, here there are 3)

SECTION 3: Writing Task (30 MINUTES)

SECTION 1 – APTITUDE AND SKILLS

Instructions to Candidates

Speed as well as accuracy is important in this section. *Work quickly, or you may not finish the paper.* There are no penalties for incorrect responses, only points for correct answers, so you should attempt all 35 questions.

Unless otherwise stated, all questions are worth one mark.

Question 1 – Inference

Studies have shown that there is a relatively much higher occurrence of heart disease among people living in the North of England than people living in the South of England. However, there is little, if any, difference in the rate of heart disease between northerners and southerners who have the same income levels. The average income of southerners in England is considerably higher than the average income of northerners.

For each of the following statements, select one of these five options:

1. *True*
2. *Probably true*
3. *Inadequate data*
4. *False*
5. *Probably false*

- A. The easiest way to eliminate heart disease in England would be to raise the general standard of living.
- B. People in high-income brackets are in a better position to avoid developing heart disease than people in low-income brackets.
- C. There is a lower rate of heart disease among northerners with relatively high incomes than among northerners with much lower incomes.
- D. Whether northerners have high incomes or low incomes makes no difference to the likelihood of their developing heart disease.

Question 2

In 1970, 60.4% of adults (people 25 years of age and older) had completed 11 years or fewer of schooling, while 4.6% had completed 3 or more years of university. In 1990, 40.0% of adults had completed 11 years or fewer of schooling, while 7.1% had completed 3 or more years of university.

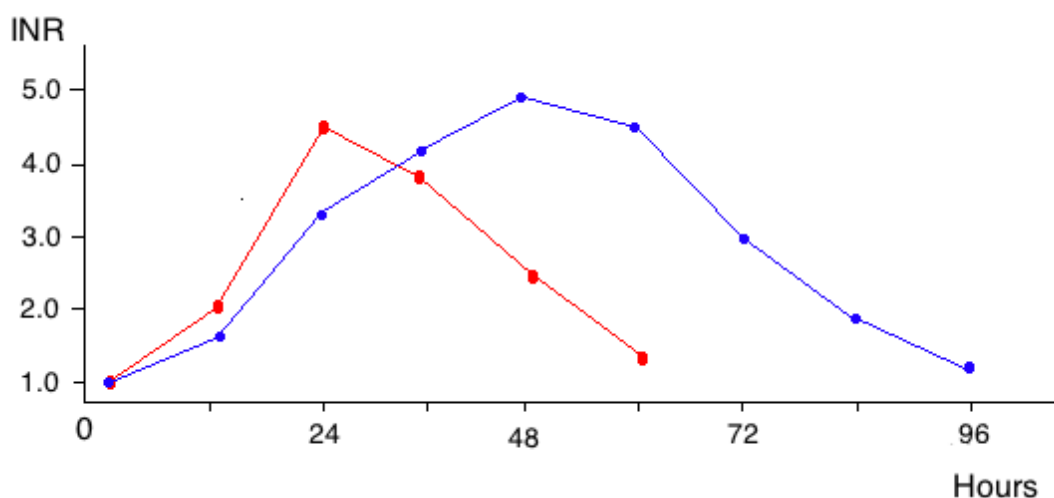
True or false?

- A. In 1970, most adults had not entered the sixth form
- B. If the trend towards more education continues at the rate indicated by the above figures, then by 2000 more than 25% of adults will have completed 3 or more years of university
- C. In 1990, for every adult who had completed 3 or more years of university, there were more than 5 adults who had completed no more than 11 years of schooling

Question 3

Warfarin is an anticoagulant drug used to prevent blood clots in patients who are at high risk of stroke. Its effects are monitored by a blood test called the International Normalised Ratio (INR) – the higher the INR, the longer blood takes to clot. Warfarin is metabolised by the P450 enzyme system in the liver. There are several other drugs that affect this enzyme system, and therefore interact with warfarin. The antibiotic erythromycin, for example, is a P450 inhibitor, slowing the metabolism of warfarin and enhancing its anticoagulant effects.

This graph shows the effect of a single dose of warfarin on INR under normal conditions (red curve) and after a dose of erythromycin (blue curve).



Mr Jones is a patient who comes into hospital with appendicitis. The surgeon wants to do an operation to remove the appendix, and asks about what medication Mr Jones takes. He says that he went to the GP and had his first dose of warfarin, as well as some erythromycin for a chest infection, this time two days ago.

The surgeon refuses to operate unless the INR is within the normal range (1-2), because high INR increases the risk of severe bleeding during the operation.

Which of the following are true?

1. Mr Jones is at lower risk of bleeding than if he had taken warfarin alone, without the erythromycin
2. The surgeon will have to wait at least another 24 hours before it is safe to do the operation
3. If Mr Jones had taken his warfarin 1 hour ago, rather than 48 hours ago, it would be safe to do the operation immediately

- A. 1, 2 and 3
- B. 2 and 3
- C. 2 only
- D. All of the above
- E. None of the above

SECTION 2 – SCIENTIFIC KNOWLEDGE AND APPLICATIONS

Instructions to Candidates

Please read this page carefully

Speed as well as accuracy is important in this section. *Work quickly, or you may not finish the paper.* There are no penalties for incorrect responses, only points for correct answers, so you should attempt all 27 questions.

Unless otherwise stated, all questions are worth one mark.

If questions ask you to write in words or numbers, be sure to write clearly in the spaces provided. If you make a mistake, erase thoroughly or cross through and try again.

Question 1

A couple, Fred and Lucy, come to see you. Lucy is 6 weeks pregnant. Fred's sister died aged 18 months from Spinal Muscular Atrophy Type 1 (SMA). This is a progressive, fully penetrant neurological condition, causing severe physical disability and death due to failure of the respiratory muscles by the age of 2 years. The condition is inherited in an autosomal recessive manner. Fred and Lucy are not related. The carrier rate in the general population is 1 in 50.

Are the following true or false?

- A. The chance of Fred being a carrier of SMA is 1 in 2
- B. If both Fred and Lucy are carriers of SMA, the chance that the baby will be affected is 1 in 2
- C. The chance that the baby will be affected is 1 in 300
- D. If Fred and Lucy were second cousins, the chance of the baby being affected would not be increased
- E. All individuals inheriting 2 mutated copies of the SMA gene will develop the condition

Question 2

A triangle is made between three points:

(a, b)

$(a + \sqrt{2}, b)$

$(a + \sqrt{2}/3, b - 2\sqrt{2})$

What is its area?

A. $a + \sqrt{2}$

B. ab

C. 2

D. $2\sqrt{3}$

Question 3

A hospital uses an HIV test that gives the following results:

- For a patient who really has HIV, the test is positive 97% of the time.
- For a patient who does not have HIV, the test is positive 2% of the time ('false positive').

Let's say that 1% of all patients have HIV.

If Mr Smith has a test, and the result comes back negative, what is the chance that he really is virus-free?

A. 99.97%

B. 90%

C. 3%

D. 0.03%

SECTION 3 – WRITING TASK

Tests the capacity to develop ideas and to communicate them effectively in writing

NB. This section is NOT a test of knowledge

“Let food be thy medicine and medicine be thy food”

Hippocrates

Write a unified essay in which you address the following:

- Explain what you think the author means by this statement
- Advance an argument *against* this statement
- How far do you think this statement applies to modern-day life?