KAPLAN

TEST PREP AND ADMISSIONS

BMAT Sample Questions

2009

ANSWERS AND EXPLANATIONS

- Section 1: Aptitude and Skills
- Section 2: Scientific Knowledge and Applications

COMMENTARY

- Section 3: Writing

Section 1: Aptitude and Skills – Answers and Explanations

1. (D) Some flautists adore three composers

This question is challenging as it hinges on the definition, in logic terms, of 'some', which simply means 'more than one'. The key, then, is in understanding what it means, and doesn't mean, to say that 'Some cellists adore Schumann, and some adore Bach'. We know from the first sentence that all musicians adore Handel. Thus, we can divide cellists into at least two groups:

Those who adore Handel and Schumann	Those who adore Handel and Bach

But answers **(A)** and **(B)** suggest two additional groups:

Those who adore Handel, but neither Schumann nor Bach	Those who adore Handel, Schumann and Bach

In fact, either of these groups *could* exist, without conflicting with the conductor's statements. She did not say that the 'some cellists' who adore Schumann and the 'some cellists' who adore Bach are mutually exclusive – nor did she say that they account for all the cellists in the orchestra. We can't infer beyond the logical meaning of her words, so the groups in **(A)** and **(B)** could exist, or they could not. But the key is that they don't *have to exist*, on the basis of the conductor's words – they aren't definitely true, so these two answers are wrong.

Similarly, answer **(C)** says that 'Some flautists adore Bach' – this might or might not be true, as the conductor has not mentioned Bach in reference to the flautists. Since we don't know for certain, the answer is out.

Answer **(D)** says that 'Some flautists adore three composers'. How does this stack up to our statements? We know that all musicians adore Handel, and all flautists adore Mozart. So all flautists must adore at least two composers – that's something that must be true, based on the conductor's remarks. We can go a step further and see that some flautists must adore at least three composers, as some adore Rimsky-Korsakov in addition to Handel and Mozart. So statement **(D)** must be true.

We cannot conclude the statement made in answer **(E)**, as we don't know for sure that any percussionists adore more than three composers. They all adore Handel and Rimsky-Korsakov, and none of them adores Bach, but we don't know about a third who any of them might adore. So this answer is out, and our sole correct answer is **(D)**.

2. 72.9%

This question is tricky, for two reasons: 1) we're not told the starting price of the camera, and 2) there are no answer choices. There's potentially a third twist, in that we're asked to give our answer as a percentage to one decimal place, and do so without a calculator! Thankfully, Kaplan has a helpful technique for percentage questions without a starting value for the original: always pick 100 for the original value. This makes the maths a lot simpler. Here, we can start with £100 for the price of the camera on Friday. It's marked down by 10 per cent on Saturday, so the price on Saturday is £100 - £10 = £90, as £10 is 10% of £100.

Then, on Sunday, the £90 is marked down another 10%; 10% of £90 is £9, so the price on Sunday is £90 - £9 = £81. Finally, on Monday, the price is marked down a further 10 per cent. Ten per cent of £81 is £8.10, so the final sale price on Monday is £81 - £8.10 = £72.90. We calculate the percentage by dividing the price on Monday, £72.90, by the price on Friday, £100, and $\frac{72.90}{100}$ = 72.9%.

You could do the problem without picking a number, using a variable such as *p* for the initial price of the camera on Friday. The price on Saturday would be 90 per cent of the price on Friday, or .9*p*. The price on Sunday would be 90 per cent of the price on Saturday, or .9(.9*p*). Likewise, the price on Monday would be 90 per cent of the price on Sunday, so the final sale price would be .9(.9(.9*p*)). This would multiply out as .729*p*, which is equal to 72.9%. If you have trouble conceptualising that, then it's definitely quicker to pick a number for the starting value.

3. (B)

The conclusion of the argument is the author's main point. The rest of the argument as stated is evidence, backing up this main point in some way. Sometimes the conclusion comes as the final sentence of the argument; on the BMAT, this is not always the case. Here, the author's main point comes in the middle of the argument: 'Regardless of any changes to legislation, the media could do more to increase organ donation at present'. The rest of the argument is an example of how the media's current practice is deficient, as they rarely mention how readers or viewers can 'opt-in' to the organ donor registry. This shortcoming is contrasted with standard media practice in the USA and Canada, where viewers are routinely given contact details for the donor registry following stories on the need for more donated organs. The conclusion is nicely summarised in answer **(B)**, which admittedly abstracts things a bit, but matches the author's main point directly.

All the other answers here touch on relatively minor points of the author's argument, or are not really part of it at all. For instance, one might infer that it is effectively easier to become an organ donor in the USA or Canada than in the UK, as answer **(A)** states, but this is hardly the author's main point, as the argument is focused on media coverage of the need for organ donors. Answers **(C)** and **(D)** are certainly true, on the basis of our argument, but neither is the author's main point. Finally, answer **(E)** makes a conclusion that is outside the scope of our argument. Our author never goes so far as to suggest that membership on the organ donor registry should be compulsory.

4. (D) $\frac{1}{2}$

This question is a good example of a BMAT question that seems a lot trickier than it actually is. That's not to say that it's easy, but it's definitely do-able, and without requiring terribly complicated maths.

The question is slightly odd in that the table is circular, and we're told which people are meant to be seated next to each other, or directly opposite each other. From these rules, we will get enough information to determine the probability of Cindy sitting directly opposite Rachael. (This will be expressed as a fraction, with the number of such seating arrangements divided by the total number of possible seating arrangements.)

The good news: This question has a built in shortcut, of sorts. One option is to consider all possible arrangements for sitting the full group of eight. The other, simpler option is to consider the pairs who can sit directly opposite each other. Our rules may well let us determine the probability of Cindy sitting opposite Rachael on this basis.

We know from our rules that Dave will sit opposite Shannon, and Ben opposite Lola. That leaves four people with seating to be determined: Rachael, James, Patrick and Cindy. We know that Rachael and James will sit next to each other, which means one of them will sit opposite Cindy and the other will sit opposite Patrick. That means there are two possible people that could sit Rachael: either Cindy or Patrick. Cindy is one of those two possibilities, so the probability of Cindy sitting opposite Rachael is $\frac{1}{2}$, answer **(D)**.

Section 2: Scientific Knowledge and Applications – Answers and Explanations

1. (C) Her maternal uncle

As Christmas disease is an X-linked recessive disorder, every carrier or sufferer has inherited a faulty gene on the X-chromosome. As Jane's paternal grandfather suffers from the disease, all of his female offspring must also be carriers. Therefore Jane's mother and maternal aunt must carry the faulty gene on one X-chromosome. As Jane's father suffers from the disease, he must have inherited the faulty gene on the X-chromosome from Jane's paternal grandmother. Jane's father's monozygotic twin will have an identical genotype to Jane's father himself. We know Jane's mother and father both carry copies of the faulty gene on their X-chromosomes. Therefore Jane and her sister must be either carriers or suffer from the disease. Therefore Jane's maternal uncle is the only possible relative in these answer choices who can be free from disease. The correct answer is **(C)**.

2. (E) I and III only

Weak acids are only partially ionised in aqueous solution, while strong acids are almost completely ionised in aqueous solution. Citric acid is a weak acid, so is only partially ionised in aqueous solution. Ethanoic acid is a weak acid, while nitric acid is a strong acid. So a 1 M solution of lactic acid will have a lower concentration of solvated protons than a 1 M solution of nitric acid. The electrical conductivity of a solution is greater when more ions are in solution. Hydrochloric acid is a strong acid, and therefore will be almost completely ionised in aqueous solution, while lactic acid is a weak acid, and will only be partially ionised in aqueous solution. So a 1M solution of hydrochloric acid will be a better conductor of electricity than a 1 M solution of lactic acid, and the answer is **(E)**.

3. (D) 12

For a triangle, area = ½ × base × perpendicular height. The triangle in the question has one side parallel to the *x*-axis, as two of the points have an identical *y*-coordinate. This side is length $3\sqrt{2}$, the difference of the two x-coordinates. The perpendicular height of the third point is $4\sqrt{2}$. This is equivalent to its distance from *b* along the *y*-coordinate.

area $= \frac{3\sqrt{2} \times 4\sqrt{2}}{2} = \frac{3 \times 4 \times \sqrt{2} \times \sqrt{2}}{2} = \frac{3 \times 4 \times 2}{2} = 12$, or answer **(D)**.

4. (D) 

The light passes through a circular hole, so the diffraction pattern will be circular. Light from the whole circumference of the circular hole will cause a pattern of overlapping waves, causing circular rings of constructive interference (bright) and destructive interference (dim). The point of strongest constructive interference will be in the centre of the pattern. Laser light is of a single wavelength so the size of the edges of the zones of interference will not be diffuse. The correct answer is **(D)**.

Section 3: Writing – Commentary

A BMAT essay is expected always to do three things: 1) address the claim made in the quotation; 2) address the counterclaim, whether stated or implied; 3) synthesise or reconcile the two claims. The specifics vary slightly from task to task, but every BMAT essay will require you to work logically through those three steps in some form or fashion.

BMAT essays are scored on a scale from 0 to 12 in increments of 3, so possible scores are 0, 3, 6, 9, 12 and 15. Each essay is marked by two assessors, and the marks given are averaged together – so the final result ranges from 0 to 15 in increments of 1.5.

In Kaplan's experience, mastery of BMAT essay structure is key to achieving a mark of 9 or above. Giving the essay a sound, logical structure is not only essential – it's something that can be learnt and improved by writing practice essays before Test Day. Writing clearly and concisely is also imperative, but one cannot earn a top essay mark on those criteria alone.

The full criteria for marking BMAT essays is available at www.bmat.org.uk. Click on BMAT, click on Test Preparation, and locate the appropriate pdf file for Section 3.