Paper 1: Solutions

1. **B**. Some students, even good ones, got this wrong. All you needed to notice was the first line: "during the 1950s, prices rose steadily at 7% per annum". Clearly the inflation is 7%. The inflation is constant. The rate of change of price (inflation) is not changing. There was only one graph with a flat curve in the 1950s period. The rest had a gradient. (Note: Learn to distinguish between "rate of change" and "rate of rate of change". This is parallel to the speed and acceleration graphs you have come across in mechanics.)

2. **C**. Not easy. First you had to determine the timings of the overground trains which leave at 20 minute intervals. In the first instance he gets home at 4.50 pm. Now lets time his trip backwards. 5 minutes he takes to walk home. So, he gets off-board the overground train at 4.45 pm. Take off 8 minutes for the journey on the overboard train. That gives you 4.37 pm. That is when the overground train, which runs on 20 minute intervals, leaves the station. In the second instance he arrives at Euston at 5.00 pm, he takes 5 minutes to change platforms, so it is 5.05 pm. Now he will take the first overground train. The timings of the overground train, at 20 minute intervals, is then 4.37, 4.57, 5.17, 5.37 and so on. Obviously he will take the 5.17 train and get to his place by 5.30 (add 8 minutes for journey plus 5 minute walk home).

3. **C.** Time consuming and a bit mathematical.
   Mileage (km/litre) = distance/fuel used = 100/(10/0.7) = 7 km/litre (If you calculated it to be 35, for example, and went ahead with the next calculation, then you have no idea what mileage means, because it could never be 35 for a van.).
   Fuel in the fan = $36/0.7 \times (51/50) = 52.45$ litres
   Distance van can run = 52.4 * 7 = 367.2 km.
   Maximum distance for detour = 367.2 – 350 = 17.2 km.

4. **A.** Easy otherwise, but initially not easy to comprehend. Only A and B needed to be considered. In the others *Y* was not -11 hours. In B the dash for the 12 was missing. If you counted there were only 11 dashes above the 0.

5. **E**. Very difficult. Most chose A. It is not easy to see why A is not the right answer. It is however easier to see that E is more likely to be the right answer. You had to determine the *minimum* number of trains required. If the number of trains can meet the peak hour requirements, a fortiori, they can meet the off-peak requirements. If you notice in A the station that starts late, can use the first arriving train as the second train that leaves the station. This would not be possible if they both started at the same time.

6. **D.** Higher intake of anti-oxidants means lower risk of cancer. It says now where Americans take higher rate of anti-oxidants.

7. **A.** Clearly. The author does not need to assume any of B to E for his conclusion. His argument is (P1) Not enough courses for Chinese; (P2) China next superpower; (P3) UK future tied to China; (P4) No enough courses offered on Chinese; (C) UK will lag behind economically. Clearly, there are a host of other assumptions (example: learning Chinese will actually bring about closer economic association with China.). But none of B to E are relevant to his argument.

8. **D.** Not very easy. You had to see that A, B, C and E will make the idea of the new identity cards more appealing, practical and so on, but has no bearing on the above argument, which is solely based on protection against "identity theft".

9. **E.** I went for A, after initially selecting E. Most chose E. From the statement "This is the worst kind of selectivity" it seems the author is blaming them for not considering the data fairly. Then s/he says "one of the most accurate indications of global warming" further suggesting that the alternative view was disingenuous. However, this analysis does not seem to be the correct one, for reasons I do not know.

10. **C.** This was clearly an ad hoc fallacy. If you had attended classes you would not have missed it. Just because smokers are poorer students doesn't mean there is a causal relation. Here, it cannot be established that there is a causal relation between offering meals and worker satisfaction. Thus C, where is states that free snacks was *one* of many incentive packages. So, other factors could be leading to worker satisfaction. (*ad hoc fallacy*: if two things happen together does not mean one is causing the other.)

11. **D**. Difficult. Obviously you can't do the entire calculation making equations and solving them. There has to be an easier way. Assume the nth ticket costs \$40. Now the greater cost of n-1th ticket will be offset by the lesser cost of n+1th ticket (the extra money that is paid for n-1th ticket \$40.25 will be offset by the cheaper ticket at \$39.75, \$40.5 will be offset by \$39.5, and so on, for all n+2, and n+3… Which ticket will cost \$40. It would be the 41st ticket (make diagrams to verify, do not do it mathematically, you will overlook boundary cases).

40.25	40.5	40.75	41
41.25			
		42.75	43
			44
44.25			45
45.25			
46.25			
47.25			
48.25			49
49.25	49.5	49.75	50

In the diagram, some entries are not filled, start from the last row from the right and start counting squares backwards till one reaches square with \$40. Clearly on the 40th square, i.e. the 40th ticket, the cost is \$40.25 and not \$40, which is in the next, 41st, square.

(One can check mathematically to further verify. You will need to buy 40 tickets before the cost is reduced by $40 \times 0.25 = \$10$. The next ticket will be \$40 then.) Now you have to buy the same number of tickets after the 41st in order to completely offset the higher rate. So, you have to buy another 40. The total tickets come to 81, when the costs are levelled. So, on the next journey you will save money. That will be the 82nd.

12. D. Straightforward. You can't afford silly mistakes in questions like these (12-15)

13. D. Straightforward.

14. D. Straightforward.

15. B. Straightforward. (*In the handout it says D. Kindly correct it)

16. D. Straightforward. Many got this wrong. That is just terrible. The conclusion is that "all buying and selling over the internet should be banned" just because some questionable deals have gone through. (Think! Think!) Not dissimilar to banning use of money, because it is used for bribery.

17. E. I chose A. (Can anyone give me a concrete reason why A is wrong?) This passage shows that setting does not raise standards in one situation, so one can infer that setting does *not always* raise standards, assuming it has done in the past ("Setting has been advocated as the way to raise standards"). But to me this assumption is unjustified.

18. A. Note that *a conclusion* is not the same as the *main conclusion*.

19. E. Not easy. One would wonder that a race-car driver will need faster reflexes which perhaps men are more endowed with than women. Perhaps the argument is only slightly weakened, or maybe not even weakened at all. But if you look carefully at the context, the "speed and power" that is mentioned is to do with how fast one can move one's body, and how much power one can exert literally. So, these two considerations are not of any advantage in car racing. Hence the objection is valid.

20. **A**. All the others were clearly wrong, forcing one to pay attention to A. It is clear that early schooling is being equated with formal schooling.

21. **E**. You had to look for something that would weaken the argument. Lets say the argument claims that:

    if A then probably C.

    Now lets say B weakens the argument, then B should be such that:

    if (A + B) then less probably C.

    So, what option (A-E) when added to the list of premises will lessen the likelihood of the conclusion. The conclusion is that the government's proposal will turn more students away from what schools have to offer. What makes this conclusion less probable is option E.

22. **C**. Straightforward. None of the other options make sense.

23. **C**. The chart was slightly difficult to read. But if you looked enough it was easy.

24. **B**. If you want to see what is the main conclusion of the argument put a *therefore* at the end of the argument and see which sentence goes into it. Clearly, the sentence that fits is: *we should encourage any moves to establish global organizations which have supreme authority over nation states*; and NOT: *it is important to recognize that a solution to key global problems is more likely if a global authority emerges*. The latter is a supporting reason or argument for the conclusion.

25. **D**. Of the two conclusions stated in the last line one is that spread of garden plants needs to be halted. The reason given is that they are spreading into the wild. That alone does not entail that their growth should be stopped. These plants might as well help further growth of the traditional species. Thus the assumption is that they actually hinder the growth of wild plants.

26. **E**. Straightforward.
27. **B**. This is just O level math. $(48 + 47)/(12 + x) = n$, where n is some whole number. It is easy to see that $n = 7$, because 19 divides 95.

28. **D**. Not very difficult, but not easy either. Remember east is ahead of the west. Since the sun rises in the east the day starts in east first. So Pakistan is 5 hours ahead of London, and 10 hours ahead of New York and 12 hours ahead of California (all of this is +/- daylight saving hour). Alternatively, California is 12 hours behind Pakistan. You must know that Pakistan has only one time line passing through it. Thus entire Pakistan has the same time. US on the other hand has around 3 timelines passing through it. So it has 3 different times concurrently. In this case Adelaide is 1½ hrs ahead of Perth. This means Adelaide is east of Perth (just to get a picture of what is going on). So, Perth has the same time as Adelaide after 1½ hours or whenever Adelaide has time x, Perth has time $x - 1½$. The game in Perth begins at 4 pm (5 ½ in Adelaide). The game in Adelaide has to end ½ hour before that. The time in Adelaide at the end of the game is 5 pm. Now subtract the duration of the game. $25 \times 4 + 10 \times 3$ (for 3 break) = 130 min = 2 hours 10 minutes. Then starting time is 5.00 – 2.10 = 2.50 pm.

29. **C.** The calculation was straightforward. It came to 315 minutes. This would be 5 ¼ hours. Since you had to round *up* to the nearest half hour, it would be 5 ½ hours

30. **B**. Already discussed in class. The output does not *strictly* increase, because you can come up with a counter-example where the altitude increases and output decreases. However, when the claim is that it *tends to* increase it means that in most cases it increases, which is true. Just one counter-example is not good enough to overturn this more modest claim.

The logic of probability & necessity.

This works similarly to PL.

X → probably *Y*
not *Y* → probably not *X* (MT)

X → necessarily *Y*
not *Y* → necessarily not X.

Note the implication of necessity is same as →. Because A → B *iff* if A then necessarily B.

There was some suspicion that Sam had stolen the money which disappeared from someone's bag in the locker room, but she has denied it. If she had spent a lot of money on clothes last weekend, then we would have reason to think that she stole the money, because normally she could not have afforded them. But since she did not buy any clothes when we went shopping last weekend, she is not the thief.

If (Sam spent money) then probably (Sam stole money).
If ("normally"=Sam did not steal money) then probably (Sam will not spend money)

If *x* then probably *y*.
If not *y* then probably not *x*.

X then probably *Y*
Not *X*
Therefore
Not Y.

This argument form assumes that not *X* → probably not Y.

Sam did not spend money
Therefore
Sam did not steal money.