You've done a good job explaining the technical apparatus (although don't mix up your T and B!), and your explanation of Salmon's argument was good.
Your answers here would have benefitted from more fleshing out of the intuitions. Ideally, when you discuss an philosophical position, you want to engage with your opponent's intuitions that brought your opponent to the opposite position: show that they lead to some unpalateable consequences and should be revised, or show that they deliver much weaker conclusions than your opponent claims,or show that your position can actually accommodate the better part of your opponent's intuitions using this sophisticated manouevre. If none of these are an option, it is still be helpful to simply acknowledge your opponent's intuition after you have made your argument and state that you just can't adopt it. Very good philosophy can still come from such a step: you can help clarify the space of moves in the debate, and produce conditional arguments ("if you have my intuitions, you should accept X, but if you have these other intuitions, then you should accept Y").

(a) S5 is the correct logic for metaphysical necessity.

S5 is the strongest system of modal logic, with the (5) axiom $\vDash \Diamond\Box\varphi \rightarrow \Box\varphi$. This follows from the condition that the accessibility relation R must be transitive, symmetric, and reflexive on the set of possible worlds W, i.e. an equivalence relation:

- Suppose a proposition X is possibly necessary at world w
- Then, X is necessary in at least one world w' accessible from w
- By the semantics of necessity, X must be true in all words accessible from w'
- But because the accessibility relation is equivalence, these worlds are precisely the worlds accessible from w
- As a result, X will be true in all worlds accessible from w
- So X is necessary at world w

Or rather, a proponent of S5 makes the claim that the correct way to talk about metaphysical possibility should be to talk about it without relativisation to some possible world; either X is possible, or it is not.
Personally, I like to save the word "is" for statements that are not being debated and use "should" for debated statements, for clarity!

The traditional view holds that S5 is the correct system for metaphysical necessity because metaphysical modality is "unrestricted" – it deals with absolute possibility and necessity without any limitations such as what is feasible given the laws of nature, physics, or morality. The motivation for transitivity (the S4 axiom that $\vDash \Box\varphi \rightarrow \Box\Box\varphi$) aligns with this concern for what must be true given the fundamental characteristics of things – if something is metaphysically necessary, then it is intuitive that this fact could not have been otherwise. Symmetry (the B axiom that $\vDash \varphi \rightarrow \Box\Diamond\varphi$) is similarly intuitive – if some metaphysical claim is true at a particular world, that claim is metaphysically possible, and it seems strange to say that things could have been otherwise, given the fundamental nature of metaphysical necessity.

The laws of morality introduce complications; anything metaphysically necessary must be true in the world it's necessary in, but anything *obligatory* (i.e. morally necessary) might (sadly) fail to be true

It might be helpful to cash this intuition out in terms of what it says about the picture of possible worlds and whether or not we like that picture. The idea is that if some world is intermediately accessible from the actual world via a (sequence of) possible worlds, then it is *directly* accessible from the actual world. Is this a compelling picture of possibility? Why/why not?

But does truth imply *necessary* possibility, as the B axiom states? If you mean to say merely that truth implies *possibility* you're looking for the T axiom

Taken together, these intuitions provide a strong *prima facie* case for S5 being the correct logic for metaphysical necessity.

(b) S5 and S4 are 'fallacious systems for reasoning about what might have been.' (SALMON)

However, Salmon presents a powerful argument that we should doubt these intuitions, starting with an important distinction between the way things *could be* and the way things *might have been*. His paper advancing this view centres around the example of Woody, a wooden table made from matter m^*. It seems intuitive that Woody might have instead originated from some slightly different matter m' and still retaining its numerical identity. It also seems uncontroversial that there exists some suitable choice of more different matter m'' which Woody could not have originated from (as it would have then been some other object). Given a suitable choice of m' and m'', however, it could be the case that if Woody had originated from m', it *would* have been possible for it to originate from m''.

It sounds like you've understood Salmon's argument, so you should explicitly discuss the fact that transitivity is at issue. In a nutshell, Salmon says something can be *possibly possible* without being simply *possible*. His critic wants to collapse iterated possibility into simple possibility.

Why might two intelligent people disagree about whether or not possibility should collapse like so? It could be because they have different (and therefore differently restrictive) ideas of possibility, and need to agree on a common idea of possibility. This is what Salmon explores, with the logical vs. metaphysical possibility distinction.

The example is crucial because it shows how something impossible in our world (Woody originating from m'') might have been possible in a different possible world (had Woody originated from m'). This directly contradicts S4's principle that necessities must be necessarily necessary ($\vDash \Box\varphi \rightarrow \Box\Box\varphi$). The impossibility of Woody originating from m is only contingently impossible – had things been different, it might have been possible.

Good explanation of Salmon's argument

Salmon points to an equivocation between logical possibility and metaphysical possibility when describing possible worlds as the source of this confusion. By considering only *metaphysically* possible worlds in our set W, as opposed to all logically possible ones (e.g., ones where Woody is made of metal), we make it appear as though metaphysical necessity entails truth in every possible world, when in fact this is not the case.* Loosely speaking if we assume that metaphysically accessible worlds are the only ones which count, that begs the question of whether these worlds are *necessarily* the only ones which are possible.

or rather, as a source of the intuition that met. possibility is unrestricted

The big question here is whether or not it is reasonable to talk about metaphysically inaccessible possible worlds. Salmon's critic says: if they are inaccessible, what is achieved by talking about them? How can a world be inaccessible, but still be a coherent and useful thing to talk about? Salmon's critic says these worlds shouldn't be discussed. Salmon calls this the "ostrich approach"; he thinks inaccessible worlds are perfectly coherent, you shouldn't ignore them, and he gives you an account of them.

These arguments substantially undermine the claim that S5 is the correct logic for metaphysical necessity, though do not entirely defeat it, because the counter-intuitions marshalled are also shaky.

What are the relevant counterintuitions marshalled by Salmon's critic?
The critic's *claim*, of course, is that metaphysically inaccessible worlds are somehow defective, and our reasoning about possible worlds should not contain these defective constructions. What's the intuition for thinking they are defective? Would be very good to think about and spell this out.

* Not exactly: the idea is metaphysical possibility is more restricted than logical possibility, so there are things that are logically possible (i.e. coherent) but still metaphysically impossible, and so it is fair to say there are possible worlds (coherent stories about states of affairs) that are not accessible (they are not a way in which things could have been, from the perspective of the actual world)