Ultimate Secret Sauce in the Kingdom of Mice
On strategies to create exam questions – and strategies to pass exams

This is a fictional story about two hypothetical examiner-mice engaging in a brainstorming about how to create challenging FCKM exam questions – and lessons candidate-mice may learn from this.
FCKM is the Finance Certificate in the Kingdom of Mice. In the early 2000s, this certificate had gained much interest in Kingdom of Mice (short KM) when the hype around financial speculation swept over from the world of humans to the equally fast-paced world of mice…

Two examiners meet in a McMouse coffee place next to Cats Avenue to discuss an interesting problem: How to create exam questions which allow to keep pass rates at a sound 40-50%, taking into account that as years pass more and more candidates will learn from past questions, share their insight and learn all the tricks of the trade from the training companies they started to establish in KM. Archimedes has been in the business for a good while (measured in mice-years). Socrates considers himself as the father of all exams. Both are experts in great questions which hit candidates on exam day.

A: "Socrates, once again we have to dip into our joint pool of expertise to come up with some good questions. Ready for that?"
S: "Hey Sir, yes, no problem, but still I do struggle with crafting new questions."
A: "Hmm" (takes a sip from his tall white Americano-for-Mice) "It's not that difficult. You know, in our trade, we have to stay ahead of the game, I mean ahead of the candidates. We have to outsmart them." (grinning).
S: "Aha man and how do we do that?"
A: "Simple. We use a whole bag of tricks to make this happen. Know behavioural finance? We use that as well, we build on it. We play with psychology. Here an example.

(1) Surprise is the best way to 'defeat' an unprepared candidate. We mix difficult questions with rather simple ones. Imagine a candidate has just done two difficult questions, say Q1 and Q2. Then we design Q3 as overly simple to do. That comes as a surprise to the candidate. She will intuitively start to ask herself: Is it that simple or have I missed a key point? That's good enough because she will waste time. That's all we need."
S: "Ahh, got you. That's called anchoring – the student anchors to the initial expectation of difficult questions. Cool indeed". (Smiles). "I have a further trick up my mouse-sleeve.

(2) Embedding core material in an unfamiliar context. We tweak questions and embed some core material into a new, unfamiliar setting. For example, we want to test round-the-corner portfolios and we embed that into some text which talks quite a bit about mice-pension fund mechanics etc. We bet on the candidates to freeze in surprise, caught by fear of the unknown. Again, very likely 50% or more of candidates have never trained themselves in imagining variations of the typical flavour of questions. When they encounter a new setting,

it takes them time to get their head around it. Ergo, they risk spending too much time on a single question - just what we want to happen for the poorly prepared."
A: "Ha, you like squeezing them, right?" There are easier ways to ensure a target pass rate.

(3) Distracting candidates with data noise. We just add bits and pieces of information which are irrelevant to the question. For instance, for a question dealing with relative value methods for equity markets in KM, we add some buzzwords from the Mr. XYZ approach, or we sprinkle some interest rates here and there over the text or into exhibits. They will read it, might believe they need it, focus too much on it, spend too much time on it, and here we go – master failure".
S: "Yeah, I think that's in the meantime pretty known in the mice community. Surely we have to conjure up some more intriguing ways to offer the exam takers a road to nowhere."
A: "Yes, no problem:

(4) Hiding information. I see many ways to hide crucial information from the nervous eyes of candidates under stress. Example: They need a risk-free rate and we hide it away right in the title of an Exhibit. Nobody expects any key data to sit right in the title of a table; instead everybody would go off and search either in the text or in the columns of a table."
S: "Smart mouse! I like the idea. I have to try out more of this hiding-away-stuff. I believe as a mouse I'm anyway good at this. What about betting on candidates to overlook stuff in the question text?"
A: "You mean?"
S: "Well, very simple…" (takes another sip, but this time accidentally from A's coffee)..."See,

(5) Adding some footnotes e.g. underneath an Exhibit, which are overlooked in the heat of the exam battle. Not high-lightening crucial conceptual keywords like *expected* versus *unexpected* inflation in KM."
A: "Yep, that works well. The more noise we add to a question body, the likelier exam takers fall prey of being in a rush, and they will nicely overlook crucial information like footnotes." (Takes a mouse-bite from his Mushroom Panini-for-mice)
S: "What about the percentage trap? Shall we make use of this more often?"
A: "You mean, Soc?"
S: "Archy,… I mean:

(6) Betting on candidates to mix up numbers in % and in decimal form, or simply plugging in the numbers in the wrong format into their calculators. An example is the mice-adjusted mean-variance utility. If you plug in numbers as %, you need to use 0.005. If you plug in numbers in decimal form, you need to use 0.5 instead of 0.005 in the formula. On top of that we offer them numbers which they use as they psychologically anchor to those. We give them expected return in % and standard deviation in decimals. They plug it into the utility function and here we go: complete mess-up."

A: "Boy, you are a star. I mean that's already pretty sophisticated. What about more low-hanging fruits? This one for example:

(7) Offering variance when candidates need standard deviation. This is an old trick and works well. When a candidate needs a standard deviation, we offer the variance in an exhibit. Again, suffering from time pressure, the poor guys and girls may well just plug in the figure thereby forgetting to take the square root of the variance."
S: "Ha, good point. I fell into that mouse trap myself when I did the exam long time ago (of course, measured in mice-year)."
A: "Cool, any further smart ideas? Seems we are getting exhausted? And it's hot here."
S: "There is no end to our creativity… and our hunger for cheese. Have you heard about this one? The…

(8) Mixing units-trick. Say they need to calculate a return objective and we offer them data for investment management fees and assets under management. In an exhibit we give them investment fees in kilo-currency and AUM in millions. We state the units next to the data label, e.g. AUM (mouse currency mill.). When candidates then simply scan the table with their eyes, they just see the naked numbers in the columns without units mentioned. Ha, off they go, just pick the numbers from the table and plug them into their calculators without adjusting units. All wonderfully screwed up."
A: "Soc, this is cruel. I wouldn't like to sit one of your exams! Though painful, I'd prefer sitting on my mouse-tail for a week! I can add a further trick to your slippery sauce. What about this one…

(9) Masking opening and closing asset or liability values. Imagine they need to calculate a surplus return for a mice pension fund as asset return – liability return * Liabilities / Assets. We give them asset return and liability return in an Exhibit for say year 20X1 and in the same column of that year we state liability and asset values. But, the horror is in the detail: In a footnote we state that the values are end-of-year values. Plucking the numbers right out of the 20X1 column would screw it all up as liabilities and assets are supposed to be opening values (begin of year) in this formula. They would have to pick the adequate numbers out of our table column for the year 20X0."
S: "Boy, now that is really tricky. I wouldn't do that. We may end up with a pass rate of 20%! Horror mouse-shock. What about some nicer confusion?
A: "And that would be, Sir?"
S: "Tja, let's look at how we can confuse the world with interest rates…

(10) Offering short- and long-term interest rates. Say, they need to calculate an expected equity return with the risk premium approach. We give them a short-term and long-term interest rate, say T-bill and 10-year T-bond rates. As soon as a candidate starts to ponder which rate to use, we can celebrate victory. When they start to ponder, that implies, doubts are creeping in. They doubt whether what they recall from memory is actually correct. Having doubts undermines their confidence. They lose time, just what they should avoid."
A: "Well spoken, Soc. I love these tricks. Seeding confusion and doubt. Wonderful. I have another idea to share with you. It adds surprise and disbelief."

S: "Come on; tell me, my coffee is getting cold."
A: "Listen, (and be more patient!) - this is the …

(11) Designing templates large and too wide. You know, for this mice exam we provide templates to fill in. (Mice in KM are very tidy and organised. Everything has its place, even cheese.) Say we ask to circle the right answer in column 2 and to provide *one* justification for this in column 3. Assume the justification is a pretty simple one and can be stated in one reasonably short sentence. We design the template space to look big and wide, as if it waited there to receive a candidates outpouring of knowledge, not only one justification, but two, or three, as there is so much empty white space… Ahh, candidates think, can't leave that empty, seems they expect a whole paragraph. Leaving it empty makes them feel guilty!"
S: "Man, yes, I agree. That's a good way of challenging the students. Disciplined students stick to our guidelines. Where we ask for one justification, they only provide one. And yes, they shouldn't worry about empty space left in a template designed to be overly big" (haha, he laughs, mice never like empty spaces. It needs to be crowded, not messy, but with a bit of cheese in there.)
A: "Could do with some cheese-baguette. Getting hungry from all this creativity. Did you hear about the mental accounting trick?"
S: "No, are you saying mice do mental accounting?"
A: "Yes, most mice will be subject to mental accounting. The thing we can leverage is …

(12) Using mental accounting and lack of lateral thinking across FCKM curriculum chapters. Many students learn chapter by chapter. E.g. by the time they arrive at alternative investments, they have forgotten about IPS or institutional mice investors. They don't see the links between individual chapters. We just have to create questions which cut right across multiple chapters. Say we design a question on contingent immunisation (against mice fever) where we need a wooden floor return. We don't state this one, but ask them to calculate it from a spending requirement. Somewhere we mention that this is for a private mice foundation. Means, people need to recall the x% spending requirement we have in KM from the institutional investors chapter to find the floor return and carry on with their contingent immunisation calculation. That's lateral thinking across the curriculum which is needed."
S: "Ok, understood. Yes, we can do so, but we should keep this lateral stuff to a moderate level.
What about…

(13) Odd currency quotations. Think about the following example: Credit risk of a currency forward. Say you are short a forward on mice-Yen that is denominated in mice-Francs and the quote of spot and forward rates is in m-Yen per m-Francs. Say the contract forward rate is 17 and the spot rate is 19 at expiration. Most formulas assume quotation in domestic currency per foreign currency. Just looking at the rates one is enticed to believe that the forward has positive value for the long position, however inverting the rates you find it has positive value to the short position."
A: "Yeah, understood (what the heck are you talking about!). Seems logical to my mouse-brain and not a real challenge, but I do agree, it adds to overall confusion if the currency quotes are given in a way in which they are not directly usable".

S: "Ha! I got another one…

(14) The odd question from the leaves of the outer branches of the curriculum. In principle, we can test everything. We can throw in a very tricky question that can only be answered if students remember a certain sentence in the FCKM Book of Wisdom page 3651, right at the end of the 5th paragraph. Some mice will vaguely remember that sentence. Ha, it will cause them to dig up their deeper memories; they will struggle and think: It could be this, it could be that. Should I tick A or should I tick B or should I leave and go for cheese? Maybe I skip the question? Or should I better do it now? I'm sure I read about this once, but <…!>, I can't remember it anymore. Ok, let's move on… Well, all this candidate-internal speaking causes Mr or Mrs Mouse to waste time."
A: "Yes, that's a fair thing to do, a question from the fringes. They shouldn't worry about such a question. It's a luxury item to correctly answer it. If in doubt, they should skip it and come back to it at the end of the exam. Definitely we should put an odd one in."
S: "And finally, what about …

(15) Paraphrasing some original text in a question. I mean most students read either the FCKM material or some other supporting training books. They will anchor to the sentences used, the terms, the nomenclature. We can easily paraphrase those sentences just to mask a text which a candidate is actually already familiar with. We pour some paint on it… The same content worded differently. It will cause candidates to scratch their mouse-head. They will say 'it sounds weird'. An example is the yield to maturity. Technically it is an internal rate of return. So where the original reading talks about yield to maturity, we call it internal rate of return, and hui! – the candidate is seriously derailed…"
A: "Hmm, I think that's at the edge of what we can really do. We cannot deviate in terminology too much from the original material, correct?"
S: "Yeah, maybe you are right. But one further design element we can choose is…

(16) Building in easy-to-eliminate answer options.
Say the question asks for some calculation. The answer options we provide are stated such, that by looking at the answers first instead of nose-diving straight into the calculation, some of the answer options can be eliminated very quickly. The smart candidates may do that which helps them saving time. The other candidates may tackle the calculation right away. If it is complex, they may get lost by hitting the wrong calculator keys (so difficult to operate with mouse feet), not storing interim results and the like. Such questions are designed along the lines: Life as a mouse is so easy if you only knew… "

A: "That is fabulous. 1+. Still we are not finished yet, Soc. There is one feature we can always use, definitely multiple times in the exam paper…

(17) Convoluted sentences, double negation. This is demanding for our mice-students insofar, as they have to read the text very carefully whilst being under major time pressure, from all our other tricks! (Laughs so loud that bits of cheese are hopping off the table). Say e.g. we let a portfolio manager speak in the text: 'If the foreign currency is not much correlated with the foreign stock, I don't believe the hedge ratio for economic risk has no major value different from zero.' And later we ask our candidates: 'Determine whether the manager is most likely not correct.' You get my point. Our friends will wonder: Does he say not or not-not, or no, or yes, or the contrary or what the heck is actually his view?"
S: "Of course, that's part of our toolbox already. And don't forget…

(18) More weight to irrelevant text than to crucial pieces of information. Think e.g. about the situational description of an individual mouse investor's circumstances. We can talk multiple sentences about the investor's family, children, plans, goals and the like, and drop in there only a handful of words which give the all-important cues. For example that she was scared when the stock market of KM crashed last time, which is relevant to assess risk aversion. Irrelevant story-telling distracts from the golden cues. Only if the students find those needles in the haystack of words, they find the keys to unlock the answers to our questions."
A: "Any more of this stuff? I'm getting tired now, my coffee is empty, only some beans left in there."
S: "Seems you changed mouse-metier and became a bean-counter? You look a bit lost." (Laughs heartily, and this time Archimedes' coffee cup hops off the table.).
A: "Soc, no, not changing away from my beloved students. You know, it feels good to think up a very challenging exam. But equally, I have some sympathy with our student community. Most of them work very hard, some of them lose weight and the overworked fall easily prey to the cats strolling around – eaten up in the process of studying."
S: "So then, you suggest?"
A: "Moderate application of our toolbox."
S: "I'm not a cruel mouse-character either. So I agree with you. Let's put in 9 out of 18."
A: "Ok. Nine in the morning, 9 in the afternoon!"
(Ever heard two mice laughing off their socks?)

1. *Surprise*
2. *Unfamiliar context*
3. *Data noise*
4. *Hiding information*
5. *Adding some footnotes with important information*
6. *Numbers in % and in decimal form*
7. *Variance versus standard deviation*
8. *Mixing units-trick*
9. *Masking opening and closing asset or liability values*
10. *Short- versus long-term interest rates*
11. *Templates large and wide*
12. *Candidates' mental accounting*
13. *Odd currency quotations*
14. *Odd question from the leaves of the curriculum*
15. *Paraphrasing original text*
16. *Easy-to-eliminate answer options*
17. *Convoluted sentences*
18. *Haystack and cue words*

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