Guidelines on writing exam questions

Here are some tips and suggestions to help you out when you write exam questions.

Focus on an important concept (typically a common or potentially catastrophic clinical problem)

Make sure that what you test is part of your learning outcomes (writing those first is therefore extremely helpful!)

Assess application of knowledge, not recall of an isolated fact

The **stem** must pose a clear question and must stand by itself (it should be possible to arrive at the answer with the options covered). There are many papers on this subject and I'm happy to share them.

The possible answers must be plausible

Always ask what is "correct"; **NEVER** ask what is "incorrect" (unless a significant learning outcome requires negative phrasing, such as a drug that would have catastrophic effects if used)

Avoid fill-in-the blank questions (there are many reasons for this and I'm happy to share published work on why these should be avoided)

Avoid Acronyms unless they are "standard" or have been defined
(e.g. OK "SSRI", "GABA", "BRCA", "PO", etc… not OK "HgKL", "DAR", "NERs", "OS", etc…)

Avoid Irrelevant information

Avoid Negatives or double-negatives

Here is blurb that I find useful

https://testing.byu.edu/handbooks/14%20Rules%20for%20Writing%20Multiple-Choice%20Questions.pdf

Here are some tips for better stems

https://cft.vanderbilt.edu/guides-sub-pages/writing-good-multiple-choice-test-questions/#stem

Next follow examples that clarify what a good or bad stem looks like

Also, check the last page of this document for some "fillable" questions.

Simple questions
(lower order in Bloom's taxonomy), only use very few of these

NOT GOOD – *do not follow this example*

Q   Which of the following statements is correct?

Q   Each of the following statements is correct EXCEPT:

Q   Which of the following statements is true about hydralazine?

Q   Hydralazine:

Stem: Not meaningful
(does not stand on its own)

Not effective – *do not follow this example*

Q   Hydralazine can cause _____ and _____

A   Reflex tachycardia*
A   Reflex bradychardia
A   Sickle-cell anemia
A   Drug-induced systemic lupus erythromatosus*

Q   _____ and _____ are side-effects with hydralazine

A   Same answers as previous Q above

Stem: SLIGHTLY better

But not effective because
incomplete statement

More effective – *better, but see below for even better!*

Q   Which of the following side-effects are associated with hydralazine

A   Same answers as previous Qs above

Q   Hydralazine is associated with which of the following side-effects?

A   Same answers as previous Qs above

Q   Hydralazine is associated with the following side-effects:

A   Same answers as previous Qs above

Stem: good (meaningful and
stands on its own)

These types of questions are
OK but, the questions could
be even better (see below)

BETTER questions
(higher order in Bloom's taxonomy, emphasize higher-level thinking)

Use memory-plus application questions that require students to recall principles, rules, or facts in a real life context

Place the concept in a life situation or context that requires the student to recall the facts, then apply or transfer the application of these facts into a situation

Below is an "old-style" non-effective question, followed by a memory-plus application question, which is more effective. Both "bad" and "good" examples are listed, to help see the differences between types of question.

Not effective – do NOT follow this example

Q   Which of the following exercises is most likely to cause knee injuries?

A   bicycling
A   swimming
A   stretching
A   squash*

Q   Which of the following drugs is most likely to cause hemolytic anemia?

A   doxycycline
A   ceftriaxone
A   rifampicin
A   clofazimine

Simple questions

Mediocre stems

More effective – follow this example

Q   Ann's exercise routine included bicycling, swimming, stretching, and squash. Which exercise routine is most likely to have caused knee injuries?

A   Same answers as previous Q above

Memory-plus questions

Good stems

Q   Diana is a 50 year-old Caucasian woman who is treated for a severe skin infection. After developing fatigue, pain in the upper abdomen, and jaundice, she is diagnosed with hemolytic anemia. Which of the following drugs is most likely to have caused it?

A   Same answers as previous Q above

Below is a table that might come-in handy when writing exam questions

Some examples on how to write good exam questions

A	(patient description)	has	(disease)	Which of the following	(treatments, drug classes)	(are the first line of treatment, do you recommend…)?		
A	(patient description)	has	(disease)	Which of the following	(treatments, drug classes)	(is contraindicated)?		
A	(patient description)	has	(symptoms and signs or specific disease)	And is being treated with	(drug or drug class).	Which of the following	(side-effects)	are most likely to occur?
A	(patient description)	has	(symptoms and signs or specific disease)	And is being treated with	(drug or drug class).	The drug acts by	(mechanism; eg. Inhibiting, increasing)	in which of the following	(functions, processes)?
A	(patient description)	has	(disease)	Which of the following	(symptoms)	would be expected?		
A	(patient description)	has	(history, findings)	and is taking	(medications)	Which of the following medications is the most likely cause of	(one history, PE, or lab finding)?	
A	(patient description)	has	(type of injury and location)	Which of the following	(structures)	is most likely to be affected?		
A	(patient description)	has	(abnormal findings)	Which additional finding would suggest a diagnosis of	(disease 1)	rather than	(disease 2)?	
Following	(procedure, treatment)	patient develops	(symptoms and signs)	Which of the following is the most likely cause?				
"Cute" questions:	Make it a riddle!	(I am the type of headache that is most common, however, not greatly understood. I also am thought to have peripheral pain mechanism for episodic type and central pain mechanism for my chronic pain mechanisms. Lastly, NSAIDs or acetaminophen are the best treatment for me. Who am I?)						