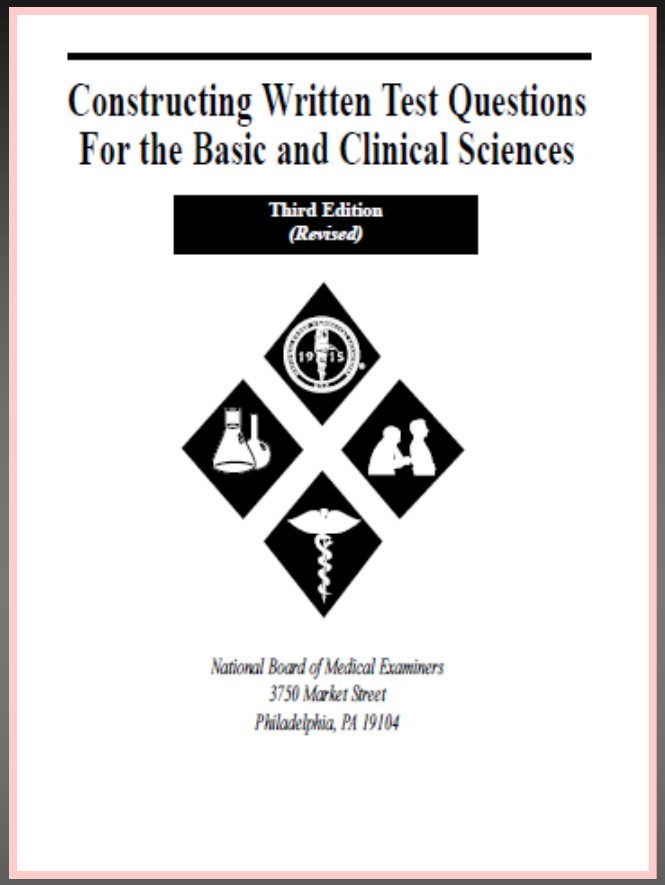
FIU | Herbert Wertheim College of Medicine

FLORIDA INTERNATIONAL UNIVERSITY

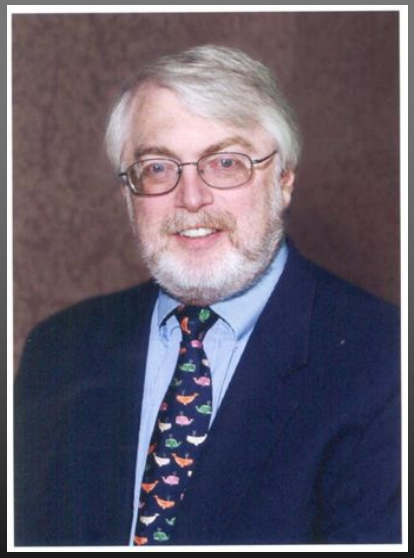
The Five Commandments & Many Rules of MCQ Creationism

Georg A Petroianu © 2005, 2010

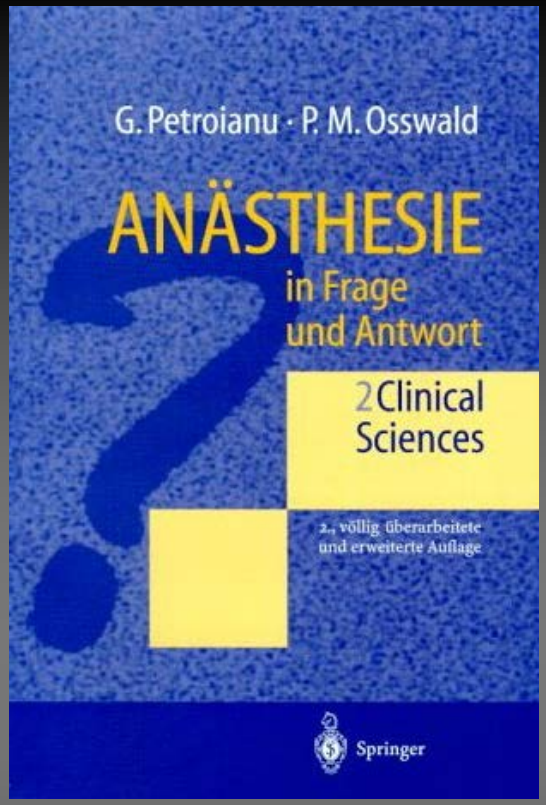


Item Writing Manual

Susan M. Case, PhD
David B. Swanson, PhD



http://www.nbme.org/publications/item-writing-manual-download.html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2 Clinical
Sciences
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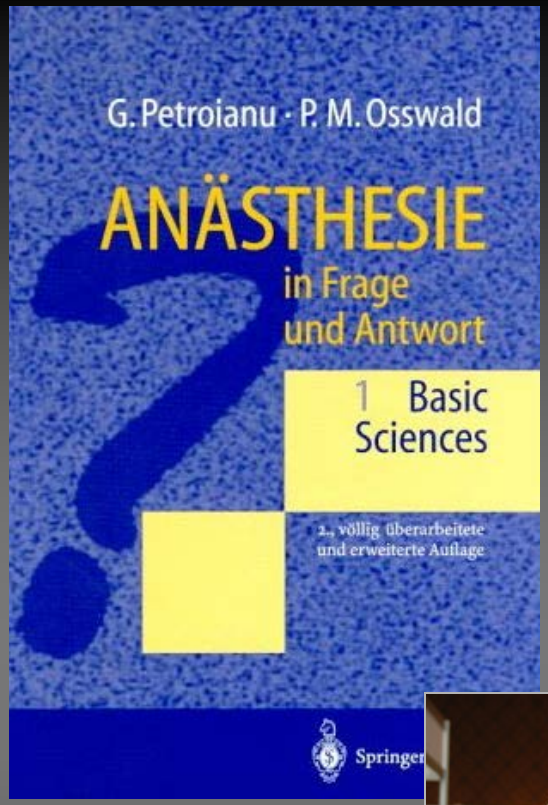
und erweiterte Auflage
Springer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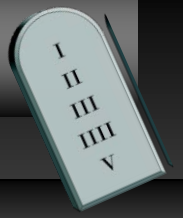
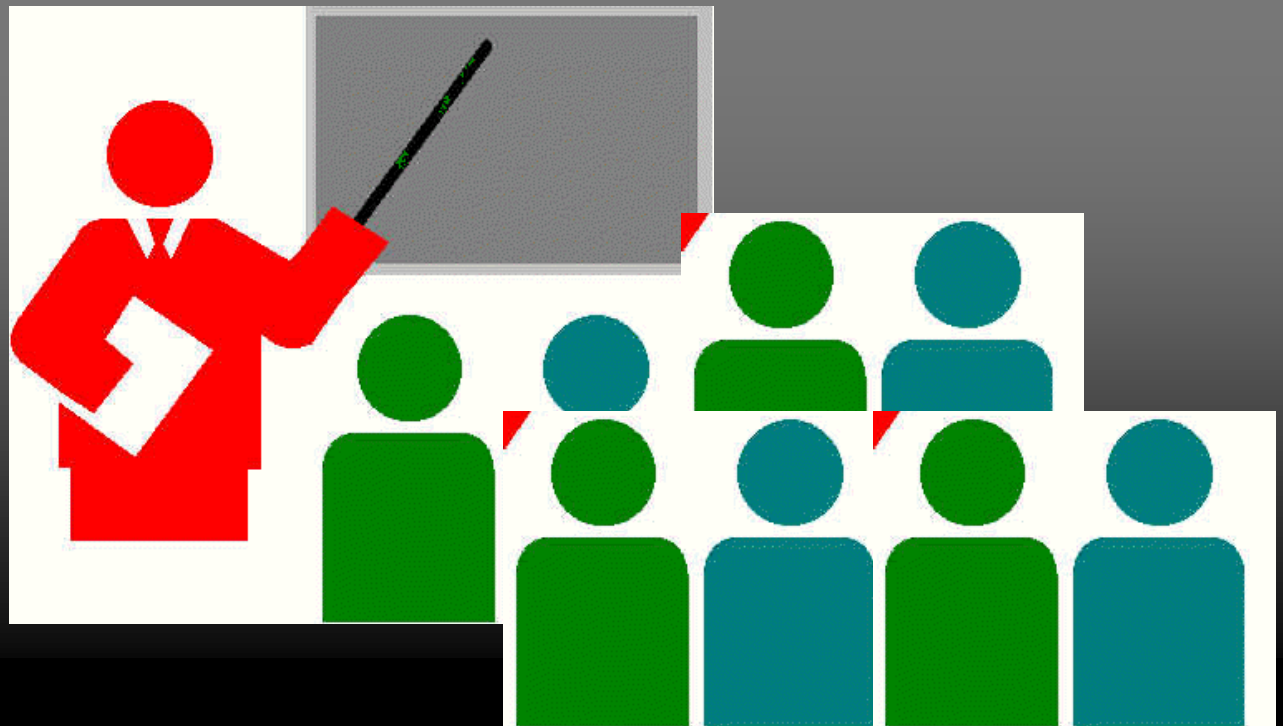
The Commandments	The How 2 [create, arrange & improve]
#1 Know the subject	Vignettes
#2 Respect the shape	Questions
#3 Don’t overdo it	Options
# 4 Be relevant	Exam Papers
#5 Respect the consumer	Quality

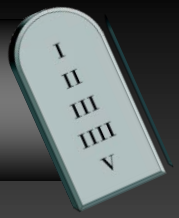
#1 Know the subject



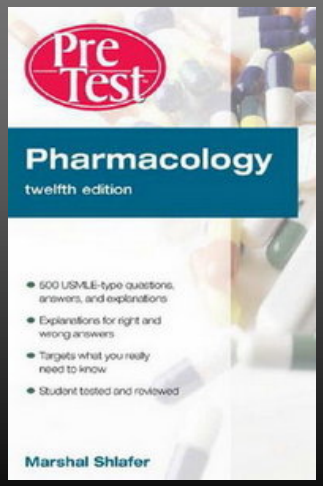
Write MCQs only on topics you know [at least slightly] more about than your students

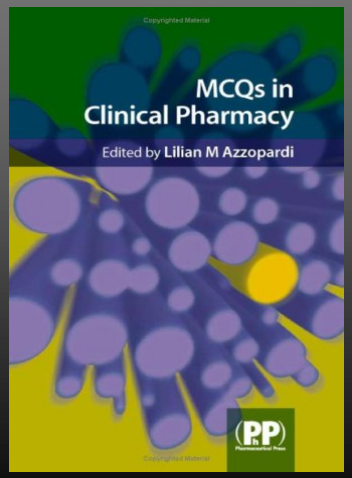


#1 Know the subject



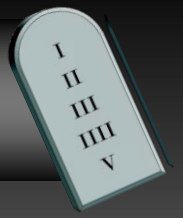
Do not “borrow” MCQs from books others have written unless you are ready to study the topic





Students will ask you questions

#2 Respect the shape

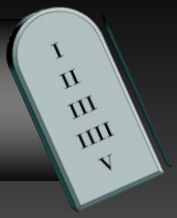


Vignette; Lead-in (Optional)

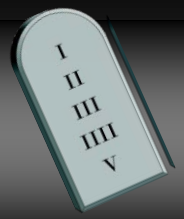
Question

Choices

#2 Respect the shape



#3 Don’t overdo it

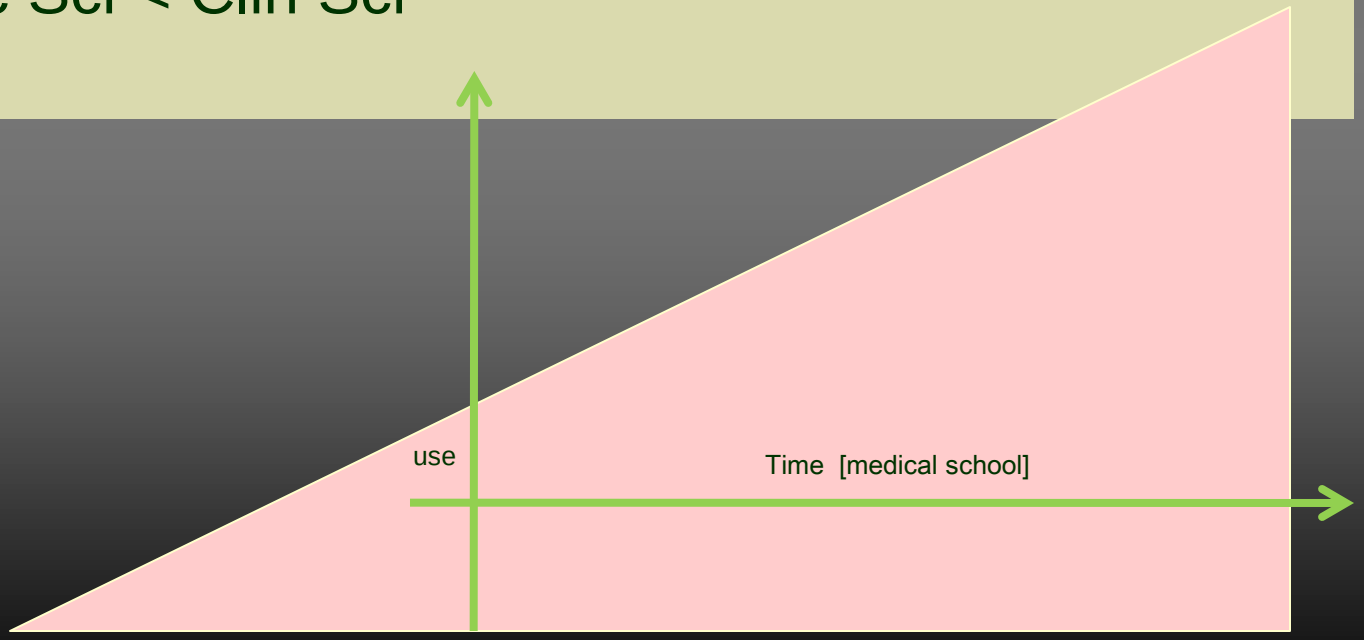


[Ignore requests from OME]

Vignette is optional

Do not use vignettes for breakfast, lunch and dinner

Basic Sci < Clin Sci

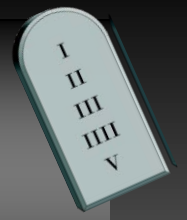


4 Be relevant

Every question should pass the "**who cares**" test

Susan M. Case

#5 Respect the consumer



Quality Control (again & again)

Author reviewed

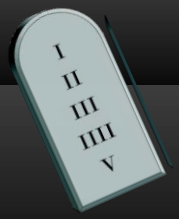
Jean-Léon Gérôme (French, 1824–1904), *Pygmalion and Galatea*, ca. 1890

#5 Respect the consumer

Quality Control (again & again)

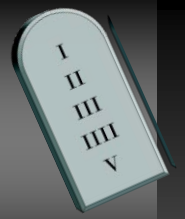
Peer reviewed for **content**

Peer review is not possible if you bully the group reviewing
Peer review is not possible the night before the exam



PIETRO DA CORTONA (b. 1596, Cortona, d. 1669, Roma)
The Stoning of St Stephen

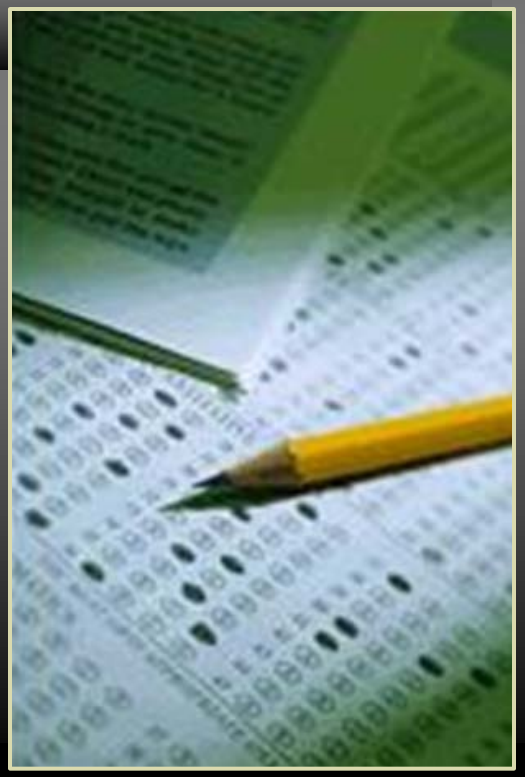
#5 Respect the consumer



Quality Control (again & again)

Have the Qs **Med Ed** reviewed for **format**

Exam tested [ideally]



How 2 Vignette

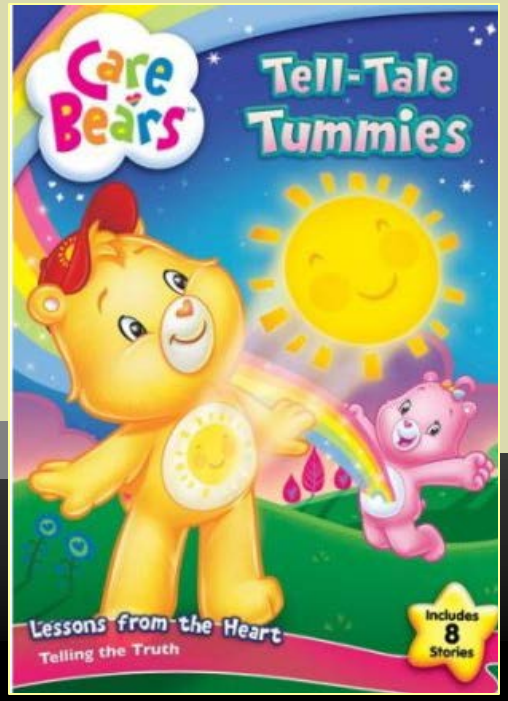
- optional
- as long as needed [contains all needed information]
- as short as possible [no unneeded information (window dressing) & no verbosity]

Ockham's razor: law of succinctness

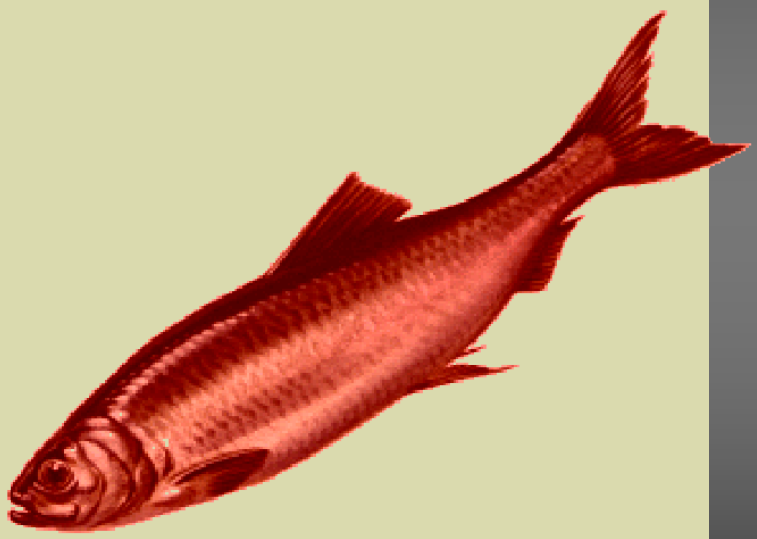
14th-century English logician and Franciscan friar, **William of Ockham**

How 2 Vignette

- avoid “red herrings”
- avoid “tell-tale” signs ?



dead give away



any diversion intended to distract attention from the main issue

How 2 Question

- **Short self contained** sentence ending with a question mark

- **No** additional information is given in the Q [all in the vignette]

- The Q is **shorter** than the vignette

Question

How 2 Question

- Answers are rarely absolutely wrong or absolutely right

- Ask for the **best option** or the **least likely** option

Question

How 2 Options

Choices

Two lecturers teach courses of fairly similar difficulty. While the quality of their teaching is comparable, on the MCQ exams of lecturer A the students consistently fare better than on the MCQ exams of lecturer B.

Which of the options listed below is the most likely explanation for this finding?

A Lecturer A administers his exams on Tuesdays

B Lecturer B is more feared than A

C Lecturer A uses a four option/single best answer format

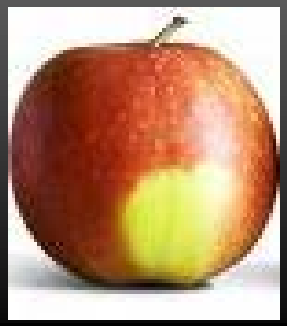
D Lecturer B uses a five option/single best answer format

How 2 Options

Choices

-A-D= 25% of random choices will be correct

-A-E= 20% of random choices will be correct



How 2 Options

Choices

- As short as possible

- Of same length

Example

In a multiple-choice question, when is the longest answer the correct answer?

A Rarely

B Sometimes

C It's almost always the correct answer, and it's often stuffed with new information that should have gone in the main part of the course but we forgot so now we're putting it in the quiz because we can't possibly leave out the tiniest detail

D Occasionally

Cathy Moore, 2007
http://blog.cathy-moore.com/2007/08/can-you-answer-these-6-questions-about-multiple-choice-questions/

How 2 Options

Choices

- Homogenous

Example

A doctor mixes the colors yellow and red. Which of the options listed below best describes the outcome?

A Purple
B Green
C Orange
D Fresh

What is wrong in the example?

Example

The options are not homogenous:
Fresh is ≠ Purple , Green & Orange

Best answer is not unambiguous:

Orange and Fresh are possible

What is wrong in the example?

How 2 Options

Choices

- Arranged in a logical sequence

Example

Which of the options listed below best describes the weight of a unicorn?

A 10 Kg
B 100 Kg
C 500 Kg
D 50 Kg

What is wrong in the example?

Example

A	10 Kg
B	50 Kg
C	100 Kg
D	500 Kg

A	500 Kg
B	100 Kg
C	50 Kg
D	10 Kg

How 2 Options

Choices

- Distribute the correct answer evenly [20-25% per option]

Example

How often is the correct answer A?

A	Usually
B	Frequently
C	Often
D	Almost never, because if **a** is the right answer, then the learner doesn't have to read all the other options we spent so much time writing and revising, and where's the ROI in that?

Cathy Moore, 2007
http://blog.cathy-moore.com/2007/08/can-you-answer-these-6-questions-about-multiple-choice-questions/

How 2 Options

Choices

- Do not use **All** or **None of the above** as an option

Example

When is “All of the above” the correct answer?

A With alarming regularity

B When we try to cover too much in one question

C When we use a question to teach instead of assess

D All of the above

Cathy Moore, 2007
http://blog.cathy-moore.com/2007/08/can-you-answer-these-6-questions-about-multiple-choice-questions/

How 2 Options

Choices

- Avoid negative phrasing

Example

When is it NOT a good idea to avoid negative questions?

A Never
B Sometimes
C Always
D What?

Cathy Moore, 2007
http://blog.cathy-moore.com/2007/08/can-you-answer-these-6-questions-about-multiple-choice-questions/

How 2 Options

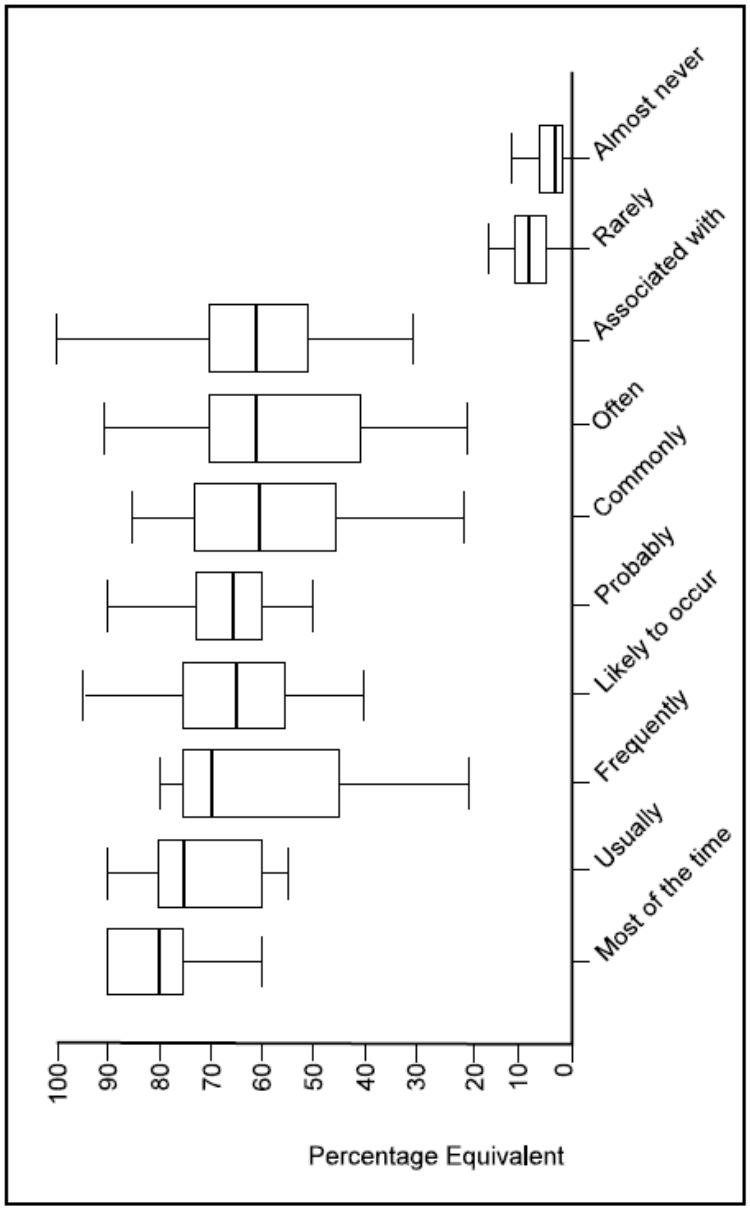
Choices

- do not use:

most of the time, usually, likely, probably, commonly, associated with, rarely, almost never

How 2 Options

Choices



How 2 Options

Choices

- Do not use absolutes

Example

Which of the options listed below best describes the likelihood of divorce in modern society?

A Never

B Always

C Depends on a variety of factors

D Is contingent on previously getting married

What is wrong in the example?

Example

A & B: Never options are never right and **Always** options are always wrong

C: Depends options are always right

D: Is contingent on previously getting married is evidently correct

Best answer is not unambiguous: both C & D are possible

None of the options answers the question logically correctly

What is wrong in the example?

How 2 Options

Choices

- Do not use **word repeats**

Example

Which of the options listed below shows the highest activity of the enzyme selenium carrotase?

A Liver
B Spleen
C Carrots
D Brain

What is wrong in the example?

Example

Word repeat

Options non homogenous

Correct answer in position C

What is wrong in the example?

How 2 Options

Choices

- Do not use conditions

Example

Which of the options listed below best describes the likelihood of hypoglycemia in a male patient of Caucasian origin with NIDDM?

A High but only if he uses insulin

B Low unless he is vigorously exercising

C Depends on a variety of factors

D 13.2 %

What is wrong in the example?

Example

male patient of Caucasian origin	irrelevant
NIDDM	acronym unfamiliar
High <u>but</u> only	conditional
Low <u>unless</u> …..	conditional
Depends	always
13.2 %	pseudo exactness

What is wrong in the example?

How 2 Quality Control – Individual Question

Cover the options and answer the Q

How 2 Quality Control – Individual Question

Explain (aloud) why incorrect options are incorrect

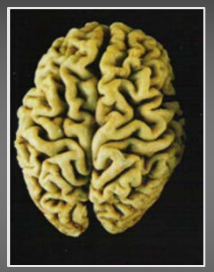
Explain (aloud) why correct option is correct

How 2 Quality Control – Exam paper

Try to answer the Q you wrote a week/month/year ago

How 2 Quality Control – Exam paper

Which of the options listed below best explains the reason why you are unable to do so?



A. You have the condition depicted
B. You were asking irrelevant details nobody remembers
C. The course was too difficult
D. My student days are long gone [i e, I do not have to study anymore]

How 2 Quality Control – Exam paper

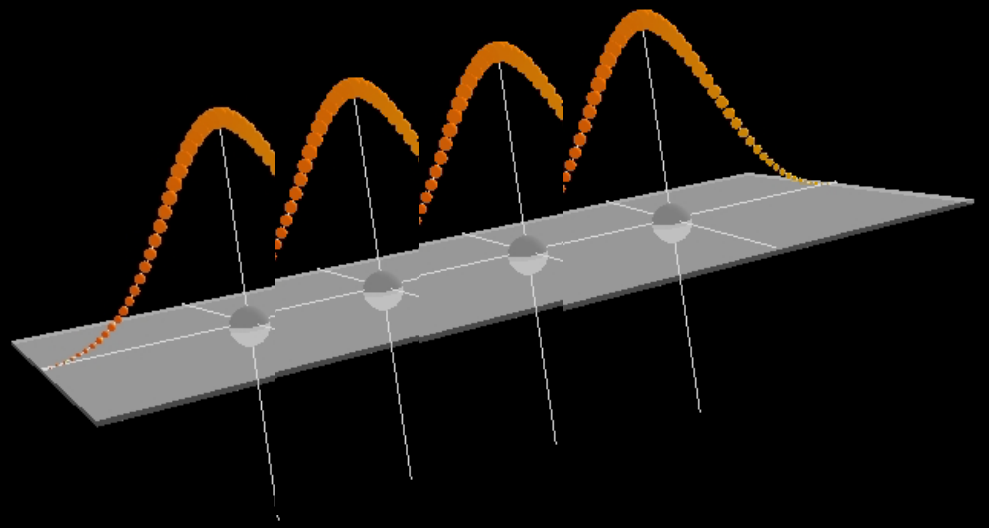
Correct Answer Distribution

20-25% A

20-25% B

20-25% C

20-25% D



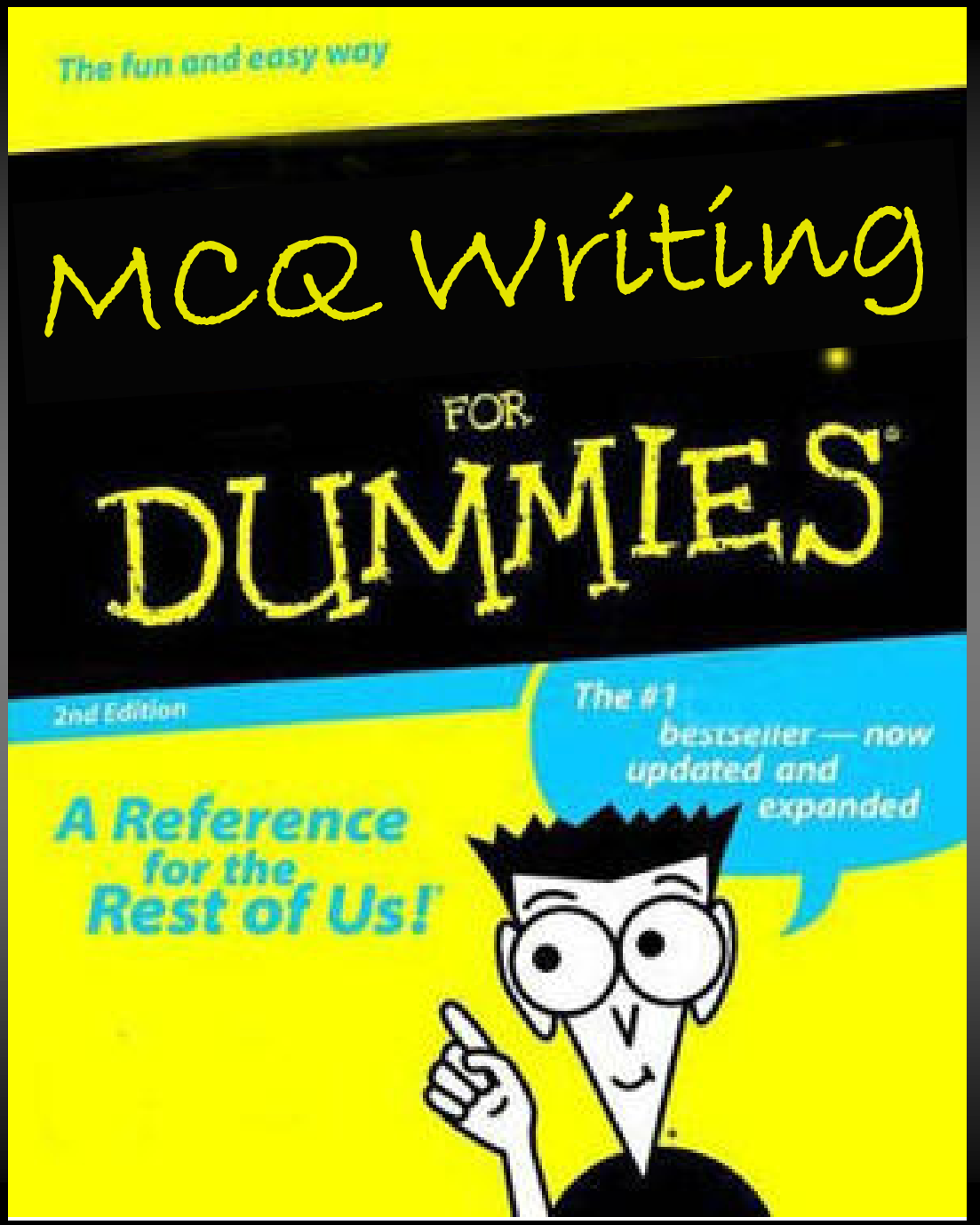
Final Check List

look at the shape
is it relevant
author review
peer review
Occam's razor
red herring
tell-tale signs
best option vs. right answer
options of same length
options homogenous

options in logical sequence
answers evenly distributed
no none or all of the above options
no negative phrasing
no subjective categories used
no absolutes used
no word repeats
no conditionals used

make sure you are able to answer your own MCQs

Thank you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