



การสร้างข้อสอบแบบปรนัย (MCQ)

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คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี

10 กรกฎาคม 2550

13.00 - 16.00 น.

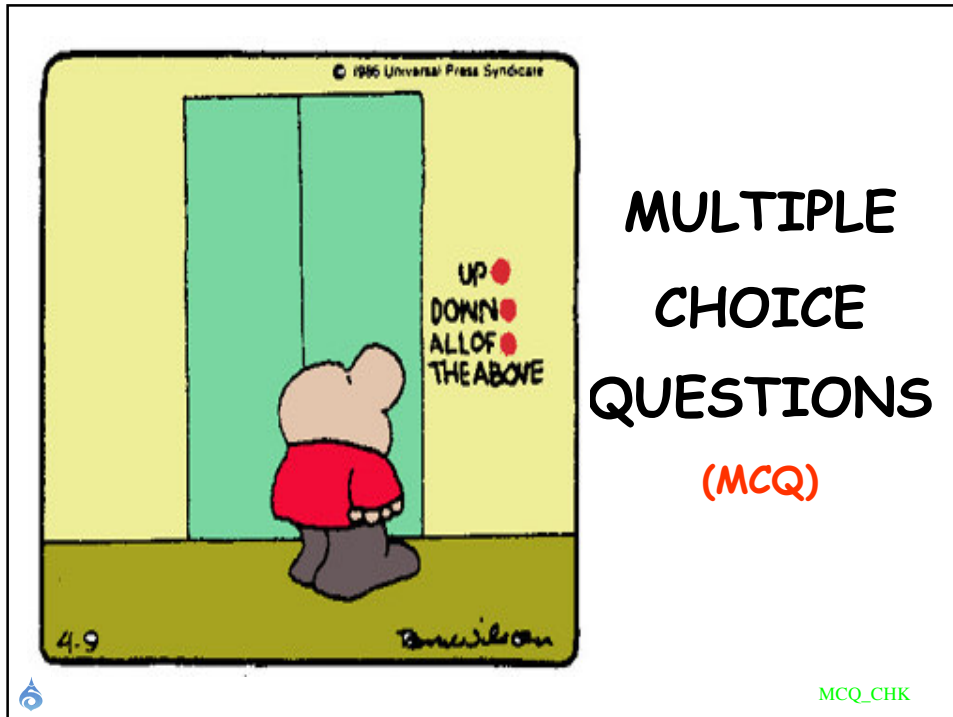
MCQ_CHK

หัวข้อเรื่อง :

- ชนิดต่างๆ ของ MCQ
- วิธีการเขียน MCQ ที่ดี
- Steps in writing MCQ
- Writing Stem, Lead - In & Options
- ตัวอย่างข้อสอบ
- ทดลองทำแบบฝึกหัด
- วิจารณ์ข้อสอบ
- สรุปลักษณะ MCQ ที่ดี



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Multiple Choice Formats (MCQ)

- **One-best-answer**
 - Conventional (A type)*
 - Matching (B type)*
 - Extended matching (R-type)*
- **True / False**
 - Complex or Multiple true / false (K-type)*
 - Simple true / false (X-type)*



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One -Best Answer (A- type) 1961

The most effective prophylactic agent for the prevention of recurrence of rheumatic fever is:

Stem

Options

- A. acetyl salicylic acid
- B. para-amino benzoic acid
- C. adrenocorticotropic hormone
- D. sulfadiazine

Distracters

E. penicillin

Correct answer



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Matching (B type)

Set 6-8

- (A) Captopril
- (B) Chlorthiazide
- (C) Clonidine
- (D) Guanethidine
- (E) Propranolol

Adverse effects

Stem or Header

Composed of 5 individual options

An introductory phrase

- D...6. Postural hypotension
- C...7. Bradycardia
- D...8. Hypokalemia

Items or Trailers



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Multiple True - False (K-Type)

A	B	C	D	E
1,2,3	1,3	2,4	4	1,2,3,4

Stem
Traumatic arteriovenous fistula produces

Options

1. a wide pulse pressure
2. increased cardiac output
3. dilatation of the left ventricle
4. pulmonary hypertension

Correct Answer

Distracter



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Multiple True- False (Simple, X-Type)

Serum electrolytes include

... Stem

Options

Answers

- A. sodium
- B. potassium
- C. albumin
- D. chloride
- E. globulin

Y	N
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Grave - Yard of MCQ's



TRUE - FALSE FAMILY



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One – Best - Answer

- *Conventional (A type)*
- *Extended matching (R – type)*



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One Best Answer(A- type) 2006

Chemistry

The following data were collected at the endpoint of a titration performed to find the molarity of an HCl solution.

Volume of HCl used = 14.4 mL

Volume of NaOH used = 22.4 mL

Molarity of standard base (NaOH) = 0.20 M

Which of the following is the molarity of the acid solution?

1. 0.13 M
2. 0.31 M
3. 0.61 M
4. 1.60 M
5. 6.10 M

Options

Lead -in

Stem



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Extended Matching Questions

Theme: Drug adverse effect

Options: (6 – 25)

- | | |
|-------------------|--------------------|
| A. Acetaminophen | H. Nitrofuradantin |
| B. Aminodarone | I. Penicillin |
| C. ACE inhibitors | J. Prednisolone |
| D. Aspirin | K. Procainamide |
| E. Bleomycin | L. Propranolol |
| F. Furosemide | M. Sulfasalazine |
| G. Metronidazole | N. Tetracycline |

For each patient, select the drug most likely to have caused the adverse effect

1. A 56-year-old man with recurrent ventricular arrhythmia began taking an antirhythmic drug 5 months ago. He now has progressive dyspnea, cough, and low-grade fever. ESR is increased. X-ray film of chest shows a diffuse interstitial pneumonia. Pulmonary function tests show decreased diffusing capacity for carbon monoxide.
2. A 62-year-old man with chronic obstructive pulmonary disease began therapy with an antihypertensive drug. Two weeks later, he has marked worsening of dyspnea and clearly audible wheezing.

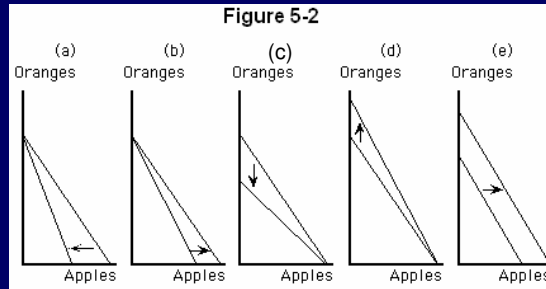


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Item Sets

Agriculture : Economics

21. Which panel in figure 5-2 shows the effect of an increase in the price of apples, other things constant?

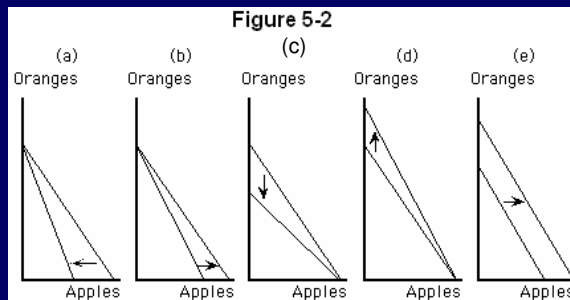


- A. Panel a
- B. Panel b**
- C. Panel c
- D. Panel d
- E. Panel e



Midterm Exam. (ECON 1101)

Item Sets



23. Which panel in figure 5-2 shows the effect of an increase in the price of oranges, other things constant?

- A. Panel a
- B. Panel b
- C. Panel c**
- D. Panel d
- E. Panel e



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Steps in Planning an MCQ Test



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Steps in Planning an MCQ Test

1. Identifying the intended outcomes to be measured
2. Preparing test specification
3. Constructing relevant test items
4. Reviewing and editing the items
5. Arranging the items in the set, typing
6. Prepare directions: *time allowed, how to record answers*
7. Testing and Scoring
8. Analysis of the test result : item analysis , total test



Gronlund NE. 6 th.ed. 1998 MCQ_CHK

1. Identify intended outcomes to be measured



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Deciding When Multiple-Choice Items Should Be Used (Example)

Educational Objective	MCQ ???	Reason
Write complete sentences	No	Response must be supplied(Essay)
Identify error in punctuation	Yes	Response may be selected
Express own idea clearly	No	Response must be supplied (Essay)
Uses gestures appropriately in giving speech	No	Response must be supplied(performance)
Identify part of sentence	Yes	Response may be selected



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2. Preparing Test Specification (Blue Print)

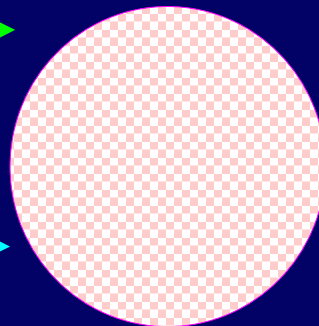


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Sampling

Domain of Interest

Test Sample



Test Sample



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Content - Related Validity

*How adequate does
the sample items represent
the tasks to be measured ?*



Table of Specification

A **two – way** chart describes the sample of items to be included in the test

- **Learning outcomes to be tested :**
Physician tasks / Level of performance
- **Selected subject matters :**
Thai Medical Council 2545



Table of Specification

<div style="text-align: right;">พฤติกรรม</div> <div style="text-align: left;">เนื้อหา</div>	Cognitive Level			Total	%
	Recall	Comprehension	Problem solving		
1.....					
2.....					
3.....					
4.....					
5.....					
ฯลฯ					
รวม					100



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Table of Specification

วิชา วิธีการสอนวิชากายภาพบำบัด

เนื้อหา	% ของ การสอบ	วัตถุประสงค์หมวด cognitive		
		ความจำ	ความเข้าใจ	การแก้ปัญหา
1. ระบบการศึกษา	5	1	4	-
2. บทบาทและลักษณะของผู้เรียน ระดับอุดมศึกษา	5	-	3	2
3. วัตถุประสงค์การศึกษา	15	-	5	10
4. การจัดประสบการณ์การเรียนรู้	30	3	15	12
5. การประเมินผลการศึกษา	30	8	11	11
6. การพัฒนาหลักสูตร	15	3	9	3
รวม	100	15	47	38

อรุณี วชิราพรทิพย์

Theories and Systems of Psychology

<i>Content Areas</i>	<i>Instructional Objectives</i>				<i>Total Items</i>
	<i>Knows Basic Antecedents</i>	<i>Knows Founding Psychologists</i>	<i>Knows Basic Tenets</i>	<i>Can Compare and Contrast Systems</i>	
Structuralism	2	2	2	2	8
Functionalism	2	2	2	2	8
Modern Association	2	2	3	3	10
Behaviorism	2	3	3	4	12
Gestalt	3	2	3	2	10
Existential Psychology	3	3	3	3	12
Total Items	14	14	16	16	60



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**Shape of a well constructed
MCQ question**



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*Incomplete sentence, Short stem,
Long & non-parallel options ;*

Diffusion hypoxia :

- A. occurs during induction period
- B. Is caused by halothane
- C. can be prevented by giving 100% oxygen for 5-10 minutes at the end of anesthesia
- D. may occur again in a few postoperative days
- E. is precipitated by prostigmine



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One Best Answer (A- type) 2006

Stem

A patient with an injury to the gluteal region has difficulty rising from a seated position and straightening his trunk, but he has no difficulty walking on level ground or flexing his legs.

Lead in



Which of the following muscles is affected ?

Option

- * A. Gluteus maximus
- B. Gluteus minimus
- C. Hamstrings
- D. Iliopsoas
- E. Obturator internus



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Shape of a Well Constructed Question

Long Stem: consisted of a clinical case and all relevant facts



Lead-in: a focused question

- A.
- B.
- C. **Short Options**
- D. **(Responses)**
- E.



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One – Best - Response ??

ยาแอสไพรินที่อยู่ในรูป buffered aspirin มีข้อดี คือ

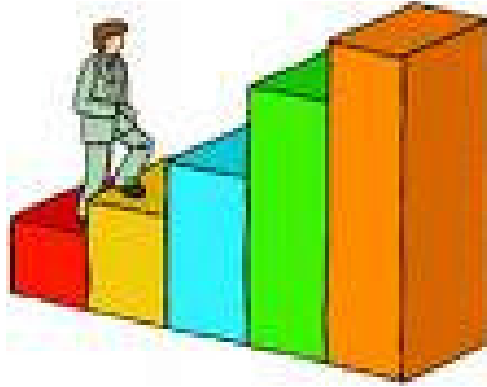
- A. ลดการระคายเคือง
- B. เพิ่มความคงตัว
- C. เพิ่มการดูดซึม
- D. ข้อ A และ ข้อ B
- E. ข้อ A, B, และ C

×

True-False



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Steps in Constructing MCQ



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Characteristics of a Well Constructed MCQ

- ▶ Stem
- ▶ Lead-in
- ▶ Options :- Correct response
- Distracters (2 - 4)



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Constructing Relevant Test Items

- Construct each item to assess a single written objective
- Choose the appropriate topic and context (task) for the question
- Construct an application of knowledge question
- Create a stem
- Create a the correct answer
- Create the distracters



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Constructing Relevant Test Items

- Choose the appropriate topic and context (task) for the question



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Examples

Example 1

Topic: Turner's syndrome

Context: Physical examination

An 18-year-old woman presents with primary amenorrhea. Which of the following signs best support the diagnosis of Turner's syndrome?

- A. Hypertension
- B. Hirsutism
- C. Short stature
- D. Epicanthal folds



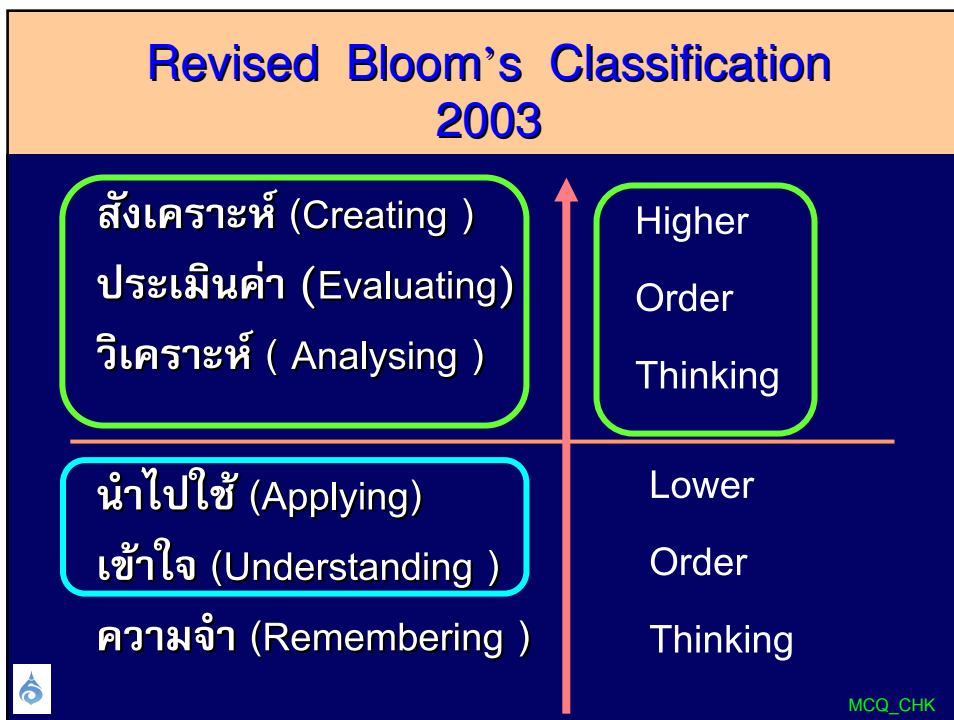
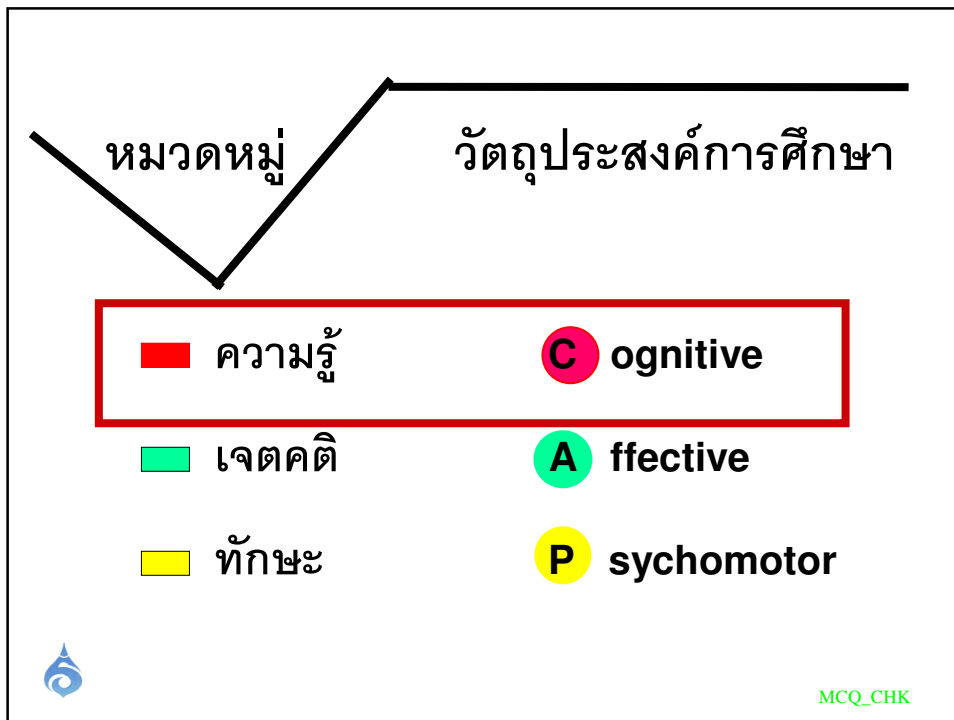
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- **Constructing Application of Knowledge Questions**



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Application of knowledge question

**Apply knowledge and / or judgment
to a realistic situation**

Thinking, Reasoning, Understanding



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Basic Science *Recall* Item Stem :

What area is supplied with blood by the posterior inferior cerebellar artery ?

Basic Science *Application of Knowledge*

A 62-year-old man develops left-sided limb ataxia, Horner's syndrome, nystagmus, and loss of appreciation of facial pain and temperature sensation.

What artery is most likely to be occluded ?



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