

GUIDE TO MULTIPLE CHOICE QUESTIONS (MCQs)

What are Multiple Choice Questions?

MCQs have a great advantage over open-ended questions: it is easy to grade them, with total parity across students. Although they can't assess the task performance ability of an individual (as all written examination forms), MCQs are commonly used in objective tests (i.e. those in which scores are not influenced by the opinion of the examiner).

Components of an MCQ

Multiple-choice items are typically composed of questions that require candidates to select **one** clearly correct or best option from those provided. They consist of a stem that "asks the question or sets up the situation for response", followed by a series of one correct and several (generally around three) incorrect options (distractors). Background material such as text, tables, graphics, etc may be included, as may specific instructions, which should be clear.

Definitions

- Item = the entire multiple choice question
- Stem = the first, sentence-like portion of the multiple choice question that 'ask the question'
- Alternates or options = all of the possible multiple-choice responses
- Keyed response = correct answer
- Distracter or foil = the wrong answers. They are called distracters or foils because they should be written to closely resemble the keyed response, therefore distracting or foiling students who are good at guessing.

For Example:

INSTRUCTIONS: Read the material below and select the one correct option from the five given.

BACKGROUND A 33-year-old woman, gravida 1, para 1, spontaneously delivers a 2460g female newborn.

TEXT: The newborn has hepatosplenomegaly, patent ductus arteriosus and cataracts. At 8 weeks gestation, the mother developed a maculopapular rash, enlarged cervical lymph nodes, sore throat, and arthralgias that spontaneously resolved in 1 week. The subsequent prenatal course was uncomplicated.

STEM: Which of the following tests during pregnancy is most likely to have predicted the findings in the fetus?

OPTIONS:

- A. Amniocentesis to determine karyotype
- B. Culture for herpes simplex virus
- C. Serial rubella titers – (Correct Answer)**
- D. Urinalysis for cytomegalovirus
- E. VDRL test

Other Examples

Q Renal artery stenosis is:

- a) The most common cause of hypertension (false)
- b) Often caused by embolization (false)
- c) A negative prognostic factor in patients with coronary artery disease (true)
- d) A growing cause of renal failure (true)
- e) Predominantly caused by fibromuscular dysplasia (false)

Q Patients with which congenital diagnoses and repairs are commonly noted to have arrhythmia diagnoses on long term follow-up

- a) Transposition of the great vessels – Mustard procedure (true)
- b) Transposition of the great vessels – arterial switch procedure (false)
- c) Univentricular heart – Fontan procedure (true)
- d) Valvar aortic stenosis – aortic valve replacement (false)
- e) Tetralogy of Fallot – VSD closure and RF outflow tract repair (true)

General Hints

There are several techniques for writing multiple-choice questions

1. Write the stem as a complete sentence.
 - o Incorrect: The speed of light is:
 - o Better: What is the speed of light?
2. Avoid “negative” stems, or using negative words such as “except” or “not.” If you can’t avoid a negative, then bold, capitalize, or underline the negative word.
 - o Incorrect: Which of the following is not an Irish poet?
 - o Better: Which of the following is NOT an Irish poet?
 - o Best: Which of the following is an Irish poet?
3. Make sure the grammar and syntax in the stem and options are the same.
 - o Incorrect: A word used to describe a noun is called an:
 - a. Adjective.
 - b. Conjunction.

- c. Pronoun.
 - d. Verb.
 - o Better: A word used to describe a noun is called:
 - a. An adjective.
 - b. A conjunction.
 - c. A pronoun.
 - d. A verb.
4. Make sure your alternatives are worded in a similar way.
- o Incorrect:

You have just spent ten minutes trying to teach one of your new employees how to change a printer cartridge. The employee is still having a great deal of difficulty changing the cartridge, even though you have always found it simple to do. At this point, you should:

 - a. Tell the employee to ask an experienced employee working nearby to change the ribbon in the future.
 - b. Tell the employee that you never found this difficult, and ask what he or she finds difficult about it.
 - c. Review each of the steps you have already explained, and determine whether the employee understands them.
 - d. Tell the employee that you can't work with them anymore because you are becoming irritable.
 - o Better:

You have just spent ten minutes trying to teach one of your new employees how to change a typewriter ribbon. The employee is still having a great deal of difficulty changing the ribbon, even though you have always found it simple to do. At this point, you should:

 - a. Ask an experienced employee working nearby to change the ribbon in the future.
 - b. Mention that you never found this difficult, and ask what he or she finds difficult about it.
 - c. Review each of the steps you have already explained, and determine whether the employee understands them.
 - d. Tell the employee that you will continue teaching him or her later because you are becoming irritable.
5. Make sure your alternatives are approximately the same length.
- o Incorrect: Which of the following is the primary reason people moved to California in 1849?
 - a. Climate
 - b. Religion
 - c. Gold was discovered in central California
 - d. Farming

What makes a good MCQ?

Not surprisingly, the first step in writing good multiple-choice items is to be clear about the purpose of the questions (what learning or skill is being assessed) and how the data resulting from the answers will be used. This involves being aware of the attributes you are seeking to measure (simple recall of facts, ability to analyse information, etc), as well as the domain (knowledge or skills area) from which the material being tested is drawn.

Clarity

It is important that responses identified as correct by the item writer are, in fact, correct, or clearly able to be assessed as the best available.

Appropriateness

Ensure that the item relates to a learning objective and is suitable for the intended audience.

Distractors

distractors should be plausible to candidates who do not possess the required knowledge or skills to identify the correct alternative. Frequent areas of misunderstanding are useful sources from which to compose distractors. Distractors are not space fillers and there is no need to create large numbers of distractors simply for the sake of it. **Grammatical**

accuracy

All options should be a grammatical match for the stem and be listed in logical or alphabetical/numerical order. Information required to answer the question must be clear and unambiguous, as must the requirements of the question. It is helpful to avoid repetitive words in the options.

Underline adjectives or adverbs that significantly alter the meaning of the stem.

Options

Ensure that all options are parallel in type of content. Correct options should not be able to be identified simply because they are so different in style from the distractors, (e.g. complexity of language or grammatical construction).

Use of the options 'All of the above' or 'None of the above' is the subject of debate. They should be used with care, rather than as a matter of course or convenience

Questions

It is useful to present the stem as a question, rather than an incomplete statement. These should be brief questions and not contain extraneous content.

Independence

Items should be independent of each other; i.e. the ability of a candidate to correctly answer an item should not depend on them having answered other items correctly, nor should a candidate find clues that will aid in answering any given item by reading another item in the same test.

Where possible, it is highly desirable to pilot the questions to assess functionality, grammar, possible ambiguity, the plausibility of distractors and the accuracy of the question and answer.

References and suggestive readings

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