

GUIDE TO MULTIPLE CHOICE QUESTIONS (MCQs)

What are Multiple Choice Questions?

Multiple Choice Questions (MCQs) are commonly used in objective tests (i.e. those in which scores are not influenced by the opinion or judgement of the person doing the scoring).

Although they cannot actually assess the ability of an individual to perform a given task (a drawback of all written examination formats), tests composed of multiple choice items can be objectively scored and the resultant data tabulated quickly. They allow efficient assessment of a broad sample of educational material.

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”¹, 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.

For Example:

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

BACKGROUND TEXT: A 33-year-old woman, gravida 1, para 1, spontaneously delivers a 2460g female newborn at 38 weeks gestation. 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

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.

¹ Reference 8, p. 31.

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.

Acknowledgement to Dr Peter White, CEO and Mr Mark Beaves, Program Manager, Fetal Surveillance Education Program.

References and Further Reading

1. Bridge, PD, Musial, J, Frank, R, Roe, T, Sawilowski, S. Measurement practices: methods for developing content-valid student examinations. *Med Teach* 2003; 25: 414-421.
2. Case, SM, Swanson, DB. *Constructing Written Test Questions for the basic and Clinical Sciences*, 3rd edn. Philadelphia, P.A.: National Board of Examiners; 2001
3. Crossley J, Humphries G, Jolly B. Assessing health professionals. *Med Educ* 2002; 36: 800-804.
4. Haladyna TM. *Developing and Validating Multiple-Choice Test Items*, 2nd edn. Mahwah, NJ: Lawrence Erlbaum Associates; 1999.
5. Henrysson S. Gathering, Analyzing, and Using Data on Test Items. In: Thorndike RL. *Educational Measurement*, 2nd edn. Washington, D.C.: American Council on Education; 1971; 130-159.
6. Linn RL, Gronlund NE. *Measurement and Assessment in Teaching*, 8th edn. Upper Saddle River, New Jersey: Prentice-Hall; 2000.
7. Oosterhoff A. *Developing and Using Classroom Assessments*, 3rd edn. Upper Saddle River, New Jersey: Pearson Education; 2003.
8. Osterlind SJ *Constructing Test Items: Multiple-Choice, Constructed-Response, Performance, and Other Formats*, 2nd edn. Norwell, Massachusetts: Kluwer Academic Publishers, 1998.
9. Tinkelman SN. Planning the Objective Test. In: Thorndike RL. *Educational Measurement*, 2nd edn. Washington, D.C.: American Council on Education; 1971; 46-80.
10. Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. *Lancet* 2001; 357: 945-949.
11. Wesman AG. Writing the Test Item. In: Thorndike RL. *Educational Measurement*, 2nd edn. Washington, D.C.: American Council on Education; 1971; 81-129.