

The multiple choice question (MCQ) format allows for the **efficient** assessment of a wide range of content for large numbers of examinees. MCQs can vary considerably in structure. Some of the common MCQ types are outlined in this document.

## Types of MCQs and examples

### Conventional multiple choice

Which one of the following cranial nerves is **responsible** for all movements of facial expression?:

- a) Trigeminal nerve (CN V)
- b) Facial nerve (CN VII)
- c) Vagus nerve (CN X)
- d) Hypoglossal nerve (CN XII)

**Scenario-based multiple choice with vignette used as the stem** (may have more than one MCQ based on the vignette)

Questions 1-3 relate to the following clinical vignette.

Mary is a 10-year-old female who was diagnosed with **diabetes mellitus** two years ago and is subsequently taking insulin. Over the past 48 hours, Mary has complained of generalised fatigue, fever, thirst, loss of appetite, nausea, vomiting and frequent urination. Due to not eating, her mother has given Mary **half** of her usual insulin dose. Mary presented to the emergency department of the local hospital where she appeared pale, dehydrated and was hyperventilating. Examination of her cardiovascular and respiratory systems were within **normal** limits.

1. Which one of the following is the likely primary cause of the **changes** in her blood pH?
  - a) Ketoacidosis
  - b) Dehydration
  - c) Hyperventilation
  - d) Renal impairment
  
2. On presentation to the emergency department, which one of the following **biochemical** processes is predominant in Mary's **liver**?
  - a) Lipolysis
  - b) Glycolysis
  - c) Gluconeogenesis
  - d) Fatty acid synthesis
  
3. Which one of the following changes is most likely to have an **important** role in the **pathogenesis** of her diabetes?
  - a) Impaired glucose uptake in skeletal muscles
  - b) Destruction of the alpha cells of the islet of Langerhans
  - c) Infiltration of the islets of Langerhans with mononuclear cells
  - d) Enhanced hepatic glucose output

### Alternate choice

Which one of the following would most effectively **slow down** the process of **photosynthesis** in plants?

- a) Cold weather
- b) Stormy weather

### Matching

Match the common name to the **phylum** of the following animals:

- |              |               |
|--------------|---------------|
| 1. Cicada    | A. Mollusca   |
| 2. Dog       | B. Annelid    |
| 3. Snail     | C. Arthropoda |
| 4. Earthworm | D. Chordata   |

### True-false

The number of **minutes** in 2.3 hours is 138 minutes.

- a. True
- b. False

### Complex multiple choice (not recommended)

Which of the following are **examples** of theories of child development?

- a) Piaget's cognitive development theory
- b) Liebig's theory of the minimum
- c) Skinner's operant conditioning theory
- d) Bandura's social learning theory
- e) A and B
- f) A, C and D
- g) B, C and D

**Note:** MCQ stems may also include a scenario, vignette, diagrams (e.g. tables, charts, graphs, equations), reading passage or other visual or digital (if using online assessment) materials.

### References

- Azer, S. (2003). Assessment in a problem-based learning course. *Biochemistry and Molecular Biology Education*, 31(6), 428-434.
- Haladyna, T., Downing, S., & Rodriguez, M. (2002). A review of multiple-choice item-writing guidelines for classroom assessment. *Applied Measurement in Education*, 15(3), 309-333. Doi: 10.1207/S15324818AME1503\_5
- Palmer, E., & Devitt, P. (2007). Assessment of higher order cognitive skills in undergraduate education: modified essay or multiple choice questions? *BMC Medical Education*, 7(49), 1-7. Doi: 10.1186/1472\_6920\_7\_49

