

## WRITING QUESTIONS FOR UNDERGRADUATE EXAMS A resource pack for MSCAA

Thank you for agreeing to contribute questions for the MSCAA bank. This pack will give you all the information you need to write good quality questions that are suitable for undergraduates.

### Single best answer items

A typical SBA has a clinical scenario, a question and a five-option answer list e.g.

A 54 year old man has recently had a myocardial infarction. His medications include aspirin, bisoprolol, perindopril, atorvastatin and furosemide. He now has severe aching in his limbs.

Which intervention is most likely to improve his symptoms?

- A. Change furosemide to bumetanide
- B. Increase dose of aspirin
- C. Reduce dose of atorvastatin
- D. Start diclofenac
- E. Stop atorvastatin

Answer E

### How to construct an SBA:

SBAs are not about testing knowledge of obscure facts, but about testing how to apply knowledge to a clinical situation.

- All SBAs should begin with a clinical vignette, giving patient history, signs, observations, investigations etc in a logical order.
- Vignettes should be 30-100 words in length.
- There should then be a lead in, which asks a specific question e.g. which is the most likely diagnosis? Avoid using 'which of the following' and use 'which' instead of 'what'.
- The options presented should all be:
  - Alphabetical or numerical– we do not use any other order
  - Plausible – try to avoid obviously redundant answers
  - Homogenous – e.g. all diagnoses, all treatments
  - Grammatically correct – don't mix tenses etc
  - Roughly the same length – so the right answer doesn't stand out
- Make sure there is only one right answer and that the right answer is in the list

## What SBAs do we want?

- It is best to think about a patient you have seen rather than something vague and abstract. Remember the curriculum – we should be testing students in what they are expected to know and have seen in their placements.
- Think about all the areas of practice – investigations, management, risk factors, side effects of treatments, ethical or legal issues, advice to patients, how basic science applies to clinical assessment.
- Encourage the student to problem solve – they may have to work out the diagnosis from the information given in order to decide the best management etc.

## What we don't want:

- We **don't** want questions about esoteric facts.
- We **don't** want questions that are multiple true false items with only one right answer, or statements of fact without any clinical setting
- We **don't** want questions with negative lead ins such as “*least likely*”, “*treatment you would not give*” etc

e.g. Which form of contraception is not progesterone only?

- A. Cerazette
- B. Depo Provera
- C. Femidom
- D. Implanon
- E. Mirena IUS

This question has no clinical information, so is a statement of fact only, and asks a negative question.

## House style

1. Aim for lead in of 30-100 words. The language should be clear and concise. Use the **present** tense.
2. The scenario poses the clinical problem which is to be solved by **one and only one** of the suggested answers in the option list. If there is any ambiguity, try to add details to the scenario to rule out any possible options other than the intended answer.
3. Where appropriate, make the scenarios patient focused and include all or some of the following components in this order:
  - age
  - gender
  - symptoms
  - duration
  - the setting, especially with regard to use of generic test material across specialties
  - relevant past history, family or social history

- physical findings (NB positive/abnormal findings first)
  - results and investigations presented in a logical, standardised order
4. The scenario should ensure that the candidate is not being assessed on factual recall but on the application of knowledge.
  5. Avoid making the scenario overcomplicated and exclude irrelevant information
  6. Avoid the phrase 'on examination' unless what follows would be otherwise ambiguous.
  7. Avoid the terms 'presents with' or 'complains of' instead use 'has' e.g A 33 year old woman has abdominal pain.
  8. Avoid the term 'history of' instead use 'with' e.g. A 46 year old man with known alcohol dependence
  9. Write numbers up to nine in full and numbers above nine as digits
  10. Ensure there is a list of **5 possible answers** to the lead in, identified serially A-E. The list should be in **alphabetical** order unless a different logical order is specified.
  11. Do not mix different skill areas in the same list (e.g. diagnoses and treatments).
  12. All options should be plausible answers for the scenario, but four of them should be incorrect or inferior.
  13. Options should be of a **similar length** and balanced content, and grammatically and logically compatible with the lead in.
  14. Avoid grammatical cues: all answers should connect to the question.
  15. Uses the terms 'woman' and 'man' rather than 'male, lady' etc.
  16. Does not use hyphens.

If you have any more queries about this resource pack please contact Veronica Davids at the MSCAA: [veronica.davids@medschools.ac.uk](mailto:veronica.davids@medschools.ac.uk)

## MSCAA Style Guide

This document is intended as a guide to our house style. Our aim is to standardise the format of each question and produce items that are homogenous.

Each single best answer (SBA) question comprises a clinical scenario ('the stem'), a single line stating the question itself ('the lead-in') and a list of five options (one correct answer and four distractors).

### The stem

- write the stem in the present tense
- should be between 30-100 words (ideally 50 words)
- omit any extraneous details
- if it is possible to use a simpler word/phrase, always use it. For example use 'before' instead of 'prior to', 'start' instead of 'commence' and 'because of' instead of 'owing to'
- use short sentences and if it is possible to cut a word out, always cut it out
- use the active tense rather than the passive
- do not use names for patients
- do not use 'you' e.g. 'he consulted you'
- a clinical stem should also be written for items that test underpinning knowledge of basic science as it puts the question in a clinical context and increases the face validity of the assessment
- avoid stems that include bad practice or errors. If you want to test this sort of issue, ask why a certain drug isn't used in the situation

### The lead-in

- should pass the 'cover test' i.e. students should be able to arrive at the correct answer without being able to see the options. Thus avoid questions such as 'which of the following statements is correct'?
- use 'which' instead of 'what'
- avoid negative phrasing or focus around bad practice, such as
  - Which is the least likely diagnosis?
  - Which treatment is the least appropriate/should be avoided?

### The five options

The five options should:

- be relevant to the stem and related to the lead-in
- be plausible and realistic, to avoid obviously redundant answers
- be homogeneous in length and content e.g. all diagnoses or all treatments
- have the initial letter of the first word in upper case
- be listed in alphabetical order. Any options that start with a number or a Greek character should be placed first. Numerical answers should be in ascending order

See 'Investigations' below for the standard format of imaging modalities.

### Abbreviations

- avoid abbreviations wherever possible. Exceptions include abbreviations that are either widely understood or are very long when spelt out:

Units of measurement, such as cm, L, mL and mmHg (but not units of time)

ACE, ACTH, ADH, ALP, AIDS, ALT, AST, APTT, ATP, BCG, BMI, BP, COPD, CRP, CT, DC (cardioversion), DNA, DXA, ECG, EDTA, EEG, eGFR, ERCP, FEV<sub>1</sub>, FSH, FVC, GABA,  $\gamma$ GT, GCS, GP, HbA<sub>1c</sub>, hCG, HDL, HIV, HLA, Ig, IGF-1, IM, INR, IV, JVP, K<sub>CO</sub>, LDL, LH, MCV, MR, MRSA, NHS, NSAID, PCO<sub>2</sub>, PCR, PET, PO<sub>2</sub>, PT, SC, RNA, SSRI, TL<sub>CO</sub>, TNF, TSH, UK, USA, UV

- abbreviations of more than one capital letter take no full stops (e.g. CT, MCV, not C.T., M.C.V.)

### Apostrophes

- use apostrophes for eponymous terms that are derived from one person's name (e.g. Alzheimer's disease, Graves' disease)
- do not use apostrophes for eponymous terms that are derived from two persons' names (e.g. Creutzfeldt–Jakob disease)
- do not use apostrophes in toponymic designations (e.g. Ebola fever, Lyme disease)

### Bacteria

- do not italicise names of bacteria as italic script can be challenging for dyslexic candidates
- the generic name should begin with a capital letter and the specific name with a lowercase letter e.g. Pneumocystis jirovecii
- anglicised versions of these names should begin with a lowercase letter (e.g. staphylococcal infection, legionella pneumonia)

### Capital/lowercase

- capitalise the first letter of proper names (e.g. Gram positive)
- use lowercase for clinical specialties (e.g. endocrinologist), disorders (e.g. type 2 diabetes mellitus) and hospital departments (e.g. intensive care unit, outpatient clinic), except for the Emergency Department
- start bullet points with a lowercase letter
- results of investigations should begin with a capital letter when appearing in list form

### Drug history

- write 's/he is taking', not 's/he is on'
- write 's/he is treated with', not 's/he receives' or 's/he is started on'
- write 's/he dialyses 3 times weekly', not 's/he is dialysed'
- do not use proprietary names unless essential; cite the generic name as used by the British National Formulary (BNF) for all medicines
- when referring to a class of drugs refer to the BNF for the term
- non-proprietary names of medicines are written with a lowercase initial letter
- write 's/he was advised to take', not 's/he was prescribed' (people are not prescribed)
- give a drug dosage within parenthesis

- use arabic numerals for the dose e.g. aspirin (75 mg once daily)
- write the frequency in common English ('three times a day' not 'tid' or 'TDS')
- write 'micrograms', not 'mcg' or 'µg'
- use 'adrenaline/epinephrine'

### En rules

En rules are longer than hyphens and are used:

- between the names of two people e.g. Cheyne–Stokes or Epstein–Barr virus
- between words of equal importance (e.g. cost–benefit, relapsing–remitting, tonic–clonic)
- to indicate a range. Thus, write 76–96, not 76 – 96 or 76-96
- to denote a minus sign

To type an en rule, press Ctrl and the minus key on the numeric keyboard (on a PC), or Alt and the hyphen key (on a Mac).

### Examination

- avoid the phrase 'On examination'
- the recommended format and order for presenting the initial observations is temp, pulse, BP, respiratory rate, and oxygen saturation.  
'Her temperature is 38°C, pulse rate 84 bpm, BP 120/80 mmHg, respiratory rate 12 breaths per minute and oxygen saturation 96% breathing air.'
- use the following style for reporting the Glasgow Coma Scale (GCS) score:  
His/Her GCS is 7.  
(Ideally include individual elements i.e His/Her GCS is 7 (E1, V2, M4))

### Font

- use Calibri 12 point typeface

### Gender

- use man/woman (not male/female/gentleman/lady)

### Greek characters

- use  $\alpha$ ,  $\beta$ ,  $\gamma$ , etc. rather than alpha, beta, gamma, etc. For example, TNF- $\alpha$ , (Exceptions: gamma globulin, interferon beta and other drug names)

### Hyphens

- do not use hyphens for age e.g. write 'A 40 year old man'
- adjectives comprising prefixes are set as one word (e.g. antituberculous, postoperative), but use a hyphen where there is a risk of mispronunciation (e.g. un-ionised)
- words beginning with 'non' are hyphenated (e.g. non-proliferative)
- inpatient/outpatient are not hyphenated
- compound modifiers that precede a noun are hyphenated (long-standing hypertension, first-degree heart block)
- hyphenate '30 pack-year smoking history' *without* a hyphen between the number and 'pack'
- use a hyphen where the name of the antibody includes an abbreviation (e.g. anti-Ro), or where the name includes more than one word (e.g. anti-neutrophil cytoplasmic antibodies, anti-smooth muscle antibodies, anti-hepatitis C antibodies)

- do not use a hyphen where the antibody is a single word (e.g. anticentromere, antimitochondrial), unless there is a danger of mispronunciation

### **Inclusive language**

- avoid gendered language where possible: 'chairman' and 'chairwoman' are acceptable but 'chair' is preferred when speaking generally or where the sex of the person concerned is not specified
- in sentences that apply to an individual who could be a man or a woman use 'his or her', not 'his' or 'their', or restructure the sentence
- use 'people with disabilities', 'visual impairments', 'or 'learning difficulties', never 'the disabled', 'the blind' or 'the handicapped'
- use 'deaf' instead of 'hearing impaired'
- use 'man/woman with epilepsy/diabetes (not epileptics or diabetics)
- sexual orientation, where appropriate, is either heterosexual, homosexual or bisexual

### **Images**

- if the question includes an image, this should be referred to at the appropriate place in the stem with the term: (see image)

### **Investigations**

- give the actual value and the reference range in parenthesis and allow students to interpret the clinical data e.g. question should give the haemoglobin result rather than stating 'the patient is anaemic'
- do not withhold information that would normally be available in every-day clinical practice. For example if serum sodium is given, then serum potassium should also be provided. However you can miss out results if it helps shorten the question and does not omit vital information.
- if there is only one result in the stem, it can be included in the paragraph. Otherwise the results should be listed below the clinical vignette under the heading 'Investigations.'
- the test names should be capitalised
- the name of the test, the result and the reference range should be separated by a tab (or two tabs if test names are long). For example:

Investigations:

Sodium 135 mmol/L (135–146)

Potassium 4.0 mmol/L (3.5–5.3)

Urea 5.0 mmol/L (2.5–7.8)

Creatinine 120 µmol/L (60–120)

- use the following style for arterial blood gas results

Investigations:

Arterial blood gas breathing 28% oxygen

pH

PO<sub>2</sub>

PCO<sub>2</sub>

Bicarbonate

- use 'breathing air' (not 'on room air') when giving arterial blood gas results

- use the following style for urinalysis results  
Urinalysis: glucose, ketones, blood, protein, nitrites, leucocytes
- use 'positive' or 'negative'. To show the degree of abnormality use 1+, 2+, 3+ or 4+ (as opposed to +, ++ etc.)
- the term 'X-ray' (not x-ray, x ray or X-Ray), although not strictly correct, is widely understood and need not be replaced by 'radiograph'
- write 'CT/MR/ultrasound/isotope scan of'
- write 'isotope bone scan'
- write 'ventilation/perfusion isotope lung scan'
- In the stem, refer to 'echocardiogram/MR angiogram' (the visible record) rather than echocardiography/MR angiography (the investigation). In the list of options, refer to echocardiography not echocardiogram.
- If the question includes an image, this should be referred to at the appropriate place in the stem with the term: (see image)

### **Job titles**

- lowercase is used in a general sense (e.g. 'a consultant neurosurgeon arrived')

### **Numbers**

- write the age one to nine in words, with 10 and over in arabic numerals (except for 'thirties', 'forties', etc.),  
Exceptions are:
  - a number at the beginning of a sentence should always be spelt out (except in answer options where all numbers should be given in numeric forms) e.g.
    - A: 1
    - B: 2
    - C: 4
    - D: 12
    - E: 16
  - use arabic numerals for names of conditions (e.g. type 2 diabetes mellitus), symbols, all abbreviated forms of units, units of alcohol, units of red cells (for transfusion) and all units of time (minutes, hours, days, weeks, months, years)

### **Past medical history**

- avoid the terms 'known', 'known to be' and 'known to have', 'diagnosed with', 'with a history of', in relation to a condition. Write 'A 40 year old man with diabetes'
- use 'history of' only for temporal separation of the presenting complaint and a past diagnosis e.g. 'A 40 year old man has breathlessness. He has a history of COPD'.

### **Presenting complaint**

- use 'has' rather than 'presents with' or 'complains of' e.g. 'A 40 year old man has breathlessness'.
- use 'breathlessness of sudden onset', not 'sudden-onset breathlessness'

### **Quotation marks**

- use single (not double) quotation marks. Double quotation marks should be used only for direct speech.

### **Setting of care**



- this should only be given if it influences the decision about the correct answer. In these cases, use of 'presents with' is accepted.
- use outpatient clinic, not outpatients

### Spacing

- do not use double spaces to separate words, sentences or paragraphs
- do not add a space before the full stop
- write <5 or –10 (not < 5 or – 10) (see note on en-rules)
- write 20% (not 20 %)
- insert a space between the value and the unit (e.g. 25 mg, 120/70 mmHg)
- insert a space either side of × and = signs

### Specialty

- not 'speciality' when referring to medical specialties

### Spelling

- use British rather than American spellings and grammar, i.e. 'organise' not 'organize', 'colour' not 'color'. Use 'outside' and 'of' but not 'outside of'

### Subscript/superscript

- superscript/subscript can be used for scientific terms (e.g. <sup>14</sup>C, <sup>131</sup>I, vitamin B<sub>12</sub>, HbA<sub>1c</sub>) but not for 1st or 2nd

### Symbols

- use symbol '×', *not* letter 'x' (e.g. 4.2 × 10<sup>9</sup>/L)
- the degree symbol in '37.0°C' is a symbol, *not* a superscript letter 'o'
- isotopes should be written as a superscript number preceding the elemental abbreviation (e.g. <sup>14</sup>C, <sup>131</sup>I)

### Units

- abbreviate body mass index as BMI and give the unit eg his BMI is 28
- abbreviate litre as 'L' and millilitre as 'mL'
- write μmol, (not umol), cmH<sub>2</sub>O, kg/m<sup>2</sup>, mmHg
- units of time are written in full in the stem (years, weeks, hours, minutes)
- units of time are abbreviated in the investigations and answers (h, min, s)
- write the time of day using the 24-h clock notation (e.g. 09:00)
- write '% predicted', not '% of predicted'

### Viruses

- viruses are known by their subfamily names (herpes simplex virus, enterovirus), which are lowercase
- HIV: the 'v' stands for virus so there is no need for 'HIV virus'