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Useful Web-sites before Test-Item-Writing

The following Web-sites contain some useful information how to construct good multiple choice items (Please note: the links may be subject to changes)

[www.esvcp.org](http://www.esvcp.org) (after login in the member area /member's news)

[www.uab.edu/uasomume/cdm/test.htm](http://www.uab.edu/uasomume/cdm/test.htm)

[www.testscoring.vt.edu/memo04.htm](http://www.testscoring.vt.edu/memo04.htm)

[www.ericae.net/digests/tm9503.htm](http://www.ericae.net/digests/tm9503.htm)

<http://www.sfsu.edu/~testing/MCTEST/guidelines.html>


For those who are too busy to go through these texts, here is a brief summary of do's and don'ts in multiple choice question writing.

#### A. FORMATTING GUIDELINES

Strict adherence to question formatting described below will greatly facilitate the ECVCP exam committee's task of editing questions and preparation of the final exam typescript. PLEASE ADHERE EXACTLY to the following format guidelines. Use the New Times Roman 12 point font. Do not use indent or tab key functions or any customised formatting. Make sure that the Style is set on "Normal" and that all "outline", "automatic number lists", "automatic bulleted lists" and "heading" options are TURNED OFF.

1. Each question should be typed double-spaced on a single page.
2. At the top of each page, think the exam section and indicate any classification.
3. Label the choices letters A to E; there should be only **ONE** correct answer (i.e. an answer like "E. All of the above are correct" or "E. None of the above are correct" is NOT acceptable). Arrange the choices in increasing or decreasing length of the answer. For pyramid questions, place answers in strict numerical order.


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4. Eg. 1
  - 1, 3
  - 2, 4
  - 2, 5
  - 3, 4, 5
5. Indicate the correct answer at the bottom of the page. **Write out the answer beside the letter.**
6. Cite a complete reference including specific page numbers (see the official reading list reported in the esvcp/ecvcp website). The inclusion of a photocopy of the journal article or relevant page or pages from the source material would allow the ECVCP exam committee to more easily verify the question and citation. If a specific reference cannot be cited for a straight-forward interpretive question, Council has agreed that such questions can be used with the Committee as the reference (i.e., the Committee is a group recognised by their peers for expertise in this field, therefore their combined knowledge is sufficient to validate such questions).
7. Place your name as contributor at the bottom of the page.

## **B. CONSTRUCTION GUIDELINES**

1. Most multiple choice questions are rejected because of construction or interpretability. Often the subject material is desirable, but poor construction requires considerable labour in order to salvage the question, and these questions are discarded out of frustration.
2. Multiple choice questions for the ECVCP examination generally consist of a brief stem (introductory question) and 5 short responses or "foils" (one correct and four distractors). Questions with more than one possible response can be submitted if properly formatted as:
  - a. "pyramid" questions. These will still have five possible responses that are combinations of numbers, listed in choices, A to E. These should be kept to a minimum, as they are difficult to write in the clear and concise manner required for their inclusion in the examination. Use this format only for those questions where it will contribute to a better quality question
  - b. written as "All are ..... EXCEPT:" questions where **4 of the 5 answers** (within choices A to E) **are correct**.
3. The stem must be clearly formatted and stated as a question or incomplete statement. The problem to be solved should be stated as clearly as possible so that the candidates know what is being asked and what kind of response is expected. Someone who is knowledgeable about the subject should be able to answer the question without looking at the "foils". The following aspects should be considered:
  - a. Negative stems, long wordy stems, statements giving background information, and diffuse stems, should preferably NOT be used.

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- b. **Stems are preferably one line in length and should not be more than two typed lines.** Questions requiring data interpretation should be reasonable in the amount of data included. Remember, candidates have only a limited time to read and answer the question and find the correct answer. This is not an exam to test reading speed.
- c. **Avoid unfamiliar terminology!** The difficulty must arise from the subject matter not from wording.
4. When writing foils, choose a correct answer that is indisputable and clearly identifiable from the reference. Make sure the distracters are incorrect, but plausible to candidates who do not know the answer. The number of questions with responses such as "All of the above", "None of the above", "Two of the above", will be limited.
  - a. **Foils are preferably only one line or, at the most, two lines long.**
  - b. The correct answer should not be noticeably longer or shorter than the distracters.
  - c. The foils should be arranged from shortest to longest in answers A to E, respectively (or vice versa).
  - d. For pyramid questions, the 1 through 5 possible answers do not need to be ordered by length, but the answers (in foils A to E) should be placed in numerical order.
  - e. Multiple choice questions asking for sequential arrangements can be used also.
  - f. Include as much information in the stem and as little in the options as possible!
  - g. Avoid irrelevant clues to the correct option.
  - h. Avoid complex, imprecise wording!
  - i. Avoid alternatives that are synonymous with, include or overlap others.
  - j. Avoid use of non-relevant sources of difficulty such as requiring a complex calculation when only knowledge of a principle is being tested.


### **EXAMPLES OF MULTIPLE-CHOICE QUESTIONS FOR THE ECVCP EXAMINATION (from the ACVP SOPs)**

\* correct answer

Single correct answer type:

Which is characteristic of 3-nitro-4 hydroxy-phenylarsenic acid toxicosis in pigs?

- A. Optic neuropathy
- B. Laminar necrosis in the cerebral cortex
- C. Wallerian degeneration in the peripheral nerves
- \* D. Degeneration in dorsal funiculi at the cervical level
- E. Bilateral symmetric poliomyelomalacia at the lumbar level

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All cause increased permeability of postcapillary venules EXCEPT:

- A. Histamine
- B. Bradykinin
- C. Leukotriene C<sub>4</sub>
- \* D. Prostaglandin E<sub>2</sub>
- E. Platelet-activating factor

Pyramid answer type:


Which are present in Bedlington Terriers with increased liver copper concentrations?

1. Granules in the cytoplasm of centrilobular hepatocytes
  2. Focal hepatic necrosis
  3. Chronic active hepatitis
  4. Micro- or macronodular cirrhosis
  5. Massive hepatic necrosis
- A. 1, 2
  - B. 1, 2, 3, 4
  - \* C. 1, 2, 3, 4, 5
  - D. 2, 3, 4
  - E. 3, 4
- A. 1, 2, 3
  - B. 1, 2, 3, 4, 5
  - C. 1, 3
  - D. 2, 4
  - E. 2, 3, 4

Sequential arrangements:

The pathogenesis of *Brucella abortus* placentitis in the goat is:

1. Replication in chronic villi
2. Replication in erythrophagocytic trophoblasts

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3. Replication in chorioallantoic trophoblasts
  4. Ulceration of chorioallantoic membranes
  5. Placental vasculitis
- A. 1, 2, 3, 4, 5
  - B. 1, 2, 3, 5, 4
  - \* C. 2, 3, 4, 1, 5
  - D. 2, 3, 1, 4, 5
  - E. 3, 2, 4, 1, 5


Interpretive question:


A 2-year old dog presenting with icterus and weight loss has the following laboratory results:

<u>Analyte</u>	<u>Patient</u>	<u>Ref interval</u>
Total bilirubin (mg/dl)	5.8	0.1-0.6
Alkaline phosphatase (IU/L)	2980	318-1050
Alanine aminotransferase (IU/L)	890	21-102
Gamma-Glutamyl transferase (IU/L)	28	1.2-6.4
Serum bile acids ( $\mu\text{mol/L}$ )	175	0-5
Cholesterol (mg/dl)	395	65-240

Which is the most correct diagnosis?

- A. Hypothyroidism
- B. Portocaval shunt
- C. Chronic active hepatitis
- D. Glucocorticoid hepatopathy
- \* E. Extrahepatic bile duct obstruction

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## GUIDELINES FOR PREPARATION OF VISUAL EXAM MATERIALS FOR HEMATOLOGY AND CYTOLOGY SECTIONS

The objective of visual materials should be to discriminate the experienced from the inexperienced clinical pathologist.

### Glass Slides

Submit at least 5 copies of slides of each proposed item.

Slides should be uniform in composition. This is of particular concern for bone marrow aspirate films and cytologic preparations.

Identify each slide with a slide number and name on a removable label. For each item submitted, include a brief written description and interpretation or diagnosis. Please include your recommendation for point distribution. Include your name on the data sheet(s).

Glass slides or kodachromes regarding cytochemistry/immunocytochemistry are also appreciated: Submit an H&E stained slide or photomicrograph together with the slide/image with the special stain. Submit a descriptive sheet (as for the glass slides) that includes a description of the key features to be recognized by candidates and the questions the submitter deems pertinent


### Kodachromes

High quality JPG or TIFF images or projected transparencies should be used to construct a question/s aimed at (1) identification of a structure, (2) asking for a diagnosis, interpretation, or (3) additional questions based on morphology present on the slide. For each slide, submit a proposed question and answer.

Up to 6 pictures might be used to illustrate a case (e.g. image of the blood tube, gross appearance of the glass slide, low magnification, high magnification for details, etc...)

They should be in sharp focus as determined by projection at 25 to 30 feet and have reasonably good colour and exposure balance.

Identify the written submissions and label each slide with your name.

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## EXAMPLES OF CATEGORIES FOR QUESTION CLASSIFICATION

### Section of General clinical Pathology

#### Pathophysiology

- Systematic Pathology
- Urinary System
- Water + E-lytes
- Endocrine System
- Metabolic Diseases
- Immune System
- Hemolymphatic
- Digestive Tract
- MusculoskelSystem
- Skin
- Infectious Diseases
- Toxicology

#### Lab. Management

- Principles of test interpretation
- Method evaluation
- Quality control

### Section of Clinical Biochemistry

- Analytical techniques and Instrumentation
- Enzymology
- Urinary System
- Proteins
- Monovalent electrolytes water balance, acid base disturbances
- Calcium, Phosphorous, Magnesium and their regulatory hormones
- Liver Function
- Carbohydrate Metabolism
- Exocrine Pancreas and Intestines
- Lipids
- Thyroid function
- Adrenocortical function
- Skeletal muscle


### Section of Hematology

- Analytical techniques and Instrumentation
- Erythrocytes
- Leukocytes
- Platelets
- Bone Marrow
- Hemostasis
- Neoplasia
- Immunehematology
- Species specific hematology

### Section of Cytology

- Technical aspects
- Principles of cytologic evaluation and interpretation
- Infectious Agents
- Inflammation
- Tumor
- Skin
- Lymphnodes, Spleen
- CNS
- Head, Neck
- Fluids in body cavities
- Synovia, Musculoskeletal Syst.
- GI, Liver, Pancreas
- Urinary tract
- Respiratory tract
- Reproductive tract



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**GLASS SLIDE SUBMISSION FORM FOR THE SECTION OF:**

please, tick one:    HEMATOLOGY    CYTOLOGY

Classification:

Case number:

Number of copies:

Specimen and stain:

Case description:

Morphologic Description:

Interpretation: (include differential diagnoses and additional tests that should be performed)

Suggested keywords and points:


Contributor's Name:

Section Leader's Evaluation and Comments (Leave Blank)

In \_\_\_\_\_

Out \_\_\_\_\_

Hold \_\_\_\_\_

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**KODACHROME SUBMISSION FORM FOR THE SECTION OF:**

please, tick one:  HEMATOLOGY  CYTOLOGY

Classification:

Case number: (Indicate the name of the file or the identification label on the slide or print)

Number of images:

Species:

Sample:

Case description:

Morphologic Description:

(Outline of the morphologic changes, with reference to each image, in the case of multiple images)

Morphologic Diagnosis(es):

(Interpretive summary of morphologic changes using appropriate terminology)

Cause:

(List the cause(s) as specifically as possible)

Other Suggestions:

(Comment on whether any of the following would be appropriate for this case, e.g., name of disease, etiologic diagnosis, pathogenesis, special stains or other techniques used for diagnosis, associated clinical pathologic abnormalities, associated (primary or secondary) lesions in other tissues.)

Proposed Examination Question: List the question(s) you feel is (are) appropriate for the lesion(s) depicted (e.g., morphologic diagnosis(es), possible cause(s), name the disease, suggest a pathogenesis, differential diagnosis, commonly associated conditions, etc.). Be sure to include what you consider to be acceptable answers.

References:


Contributor's Name:

Section Leader's Evaluation and Comments (Leave Blank)

In \_\_\_\_\_

Out \_\_\_\_\_

Hold \_\_\_\_\_

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**MULTIPLE CHOICE SUBMISSION FORM FOR THE SECTION OF:**

**please, tick one:**     GEN. CLIN. PATH.             BIOCHEMISTRY  
 HEMATOLOGY                             CYTOLOGY

Classification:

Species:

Type of question (please, select one):

- Single correct answer type
- Pyramid answer type
- Sequential arrangements
- Interpretive question

Stem of the question:

Foils:

- A
- B
- C
- D
- E

Correct answer:

Reference:

Contributor's Name:

Section Leader's Evaluation and Comments (Leave Blank)

In \_\_\_\_\_

Out \_\_\_\_\_

Hold \_\_\_\_\_