GUIDELINES ON THESIS FORMAT

Order of presentation

The order of contents should be as below:

- Blank Page
- "In the name of GOD" page
- Title Page
- Copyright Notice Page
- Dedications
- Acknowledgements
- Copy of Thesis Evaluation Form
- Abstract
- Symbols and Abbreviations
- Table of Contents
- List of Tables
- List of Figures
- Introduction
- Literature Review
- Materials & Methods
- Observations and/or Results
- Discussion
- Tables Pages
- Figures Pages
- References
- Appendix
- Abstract **(in Farsi)**
- Title Page **(in Farsi)**
- In the name of God in Farsi
- Blank Page

    - (Results and Discussion can also be combined as one section)
    - [A short section on General Conclusion(s) can also be included]

- References
- Appendices (if there is any)

Pagination

All sections before the *Introduction* (except the *Title Page*) should be numbered in Roman numerals (i, ii, iii, iv, etc.) at the bottom centre of the page. All other pages should be numbered with Arabic numbers (1, 2, 3, 4, etc.) Appendices will not be paginated.

Length of Thesis

The maximum length of the thesis text is 15,000 words. A length of 100 pages from the *Introduction* to *References* is recommended. Please do not 'pad' your thesis and reach this suggestion. This is detrimental!

Typing

The entire thesis must be typed on white A4 paper with double spacing, using Times New Roman font and font size of 12 points and with 3.5 cm left margin, and 2.5 cm margins on all other sides. The contents in the *References* section of thesis may be typed with single spacing.

Submission Date & Format

Details of thesis submission would be released nearing the actual submission period. Late submission will be penalized, except in special cases (e.g. illness supported by submitted medical certificate). The penalty is 2 marks deduction for each day after the date due.

Numeral and Unit Abbreviations

Numbers under ten should be spelt out (e.g., nine for 9) unless accompanied by an abbreviation: e.g. two centimetres or 2 cm. Do not start a sentence with Roman number.

Citations and Reference List

Literature should be cited in the text by the author's surname and year of publication: e.g. "Smith (1997) reported ..." or "This result has been observed by at least one other worker (Smith, 1997)". When there are two authors, the citation is as such: e.g. (Ahmadi and Wilson, 1997). But when there are more than two, all other authors except the first are indicated by the Latin abbreviation '*et al*.', for example "Tan *et al*. (1997) discovered..."

Other variations include citing several references together, e.g. (Taylor, 1996; Smith and Hosseini, 1998), and citing two or more references by the same author that were published in the same year, e.g. (Martin, 1991a, b).

In the *References* section, all literature must be listed in alphabetical order by the lone or first author's surname. Only literature cited in the thesis text should be included here.

The following are examples of the formats that should be used, e.g. as in journal, *Cell*:

Greenfield, L., Simpson, L., and Kaplan, D. (1975). Conversion of close circular DNA molecules to single nicked molecules by digestion with DNase I in the presence of ethidium bromide, Biochem. Biophys. Acta. *470*, 365-375.

Kikuchi, Y., and Nash, H.A (1979). Nicking-closing activity associated with bacteriophage int gene product. Proc. Natl. Acad. Sci. USA *76*, 3760-3764.

Krasnow, M.A., and Cozzarelli, N.R. (1983). Site-specific relaxation and recombination by the Tn3 resolvase: recognition of the DNA path between oriented sites. Cell *32*, 1313-1324.

Krasnow, M.A., Stasiak, A., Spengler, S.J, Dean, F., Koller, Th., and Cozzarelli, N.R. (1983a). Determination of the absolute handedness of knots and catenanes of DNA. Nature **304**, 559-560.

Krasnow, M.A., Matzuk, M.M., Dungan, J.M., Benjamin, H.W., Cozzarelli, N.R. (1998b). Site-specific recombination by Tn3 resolvase; models for pairing of recombination sites. In Mechanisms of DNA Replication and Recombination, vol. 10, N.R. Cozzarelli, ed. (New York: Alan R. Liss, Inc.), p. 637.

Names of Organisms

Scientific names of organisms are Latinised binomials that must be in *italics* whenever used. The first or generic name is written with an initial capital, the second or specific epithet is written in lower case.

Some useful points about the contents of a thesis

Title

The rules for formulating a good title are few. The title should identity the specific nature of the research and also some broader area within which the work occurred. The length of the title should be kept to a minimum, preferably approximately a dozen or so words. A good start is to avoid non-essential words or phrases, such as "Studies on the...", "Some aspects of …." and "Investigations into the……"

Acknowledgements

This section usually consists of a single paragraph of thanks to the supervisor and other academic or technical staff, colleges and institutions for ideas, advice, criticisms, facilities, services, etc. Contrary to common practice, this is not a place to 'let your hair down': you are not allowed to acknowledge your pets, religious leaders, and so on; and avoid expression of excessive gratitude to your supervisor, or anyone else.

Abstract

The *Abstract* should not exceed 200 words, and should be given within a single paragraph. The first few sentences identify the topic, the next few the research design, then the basic observations and/or results, and the last one or two, the theoretical implications of the observations and/or results. It should not contain references to figures, tables or literature.

Being an overview of the thesis, the *Abstract* should be written last. Avoid jargon (i.e., "the language, especially the vocabulary, peculiar to a particular trade, profession, or group").

Table of Contents

The Contents page lists all the major headings and sub-heading and the page numbers on which each starts.

Introduction

The *Introduction* should preferably not exceed 10% of the whole thesis. It must form a bridge from past to the present work in a stimulating manner within a few paragraphs. The "bridge", moreover, should have the shape of an inverted pyramid: In other words, a good introduction starts with a broad base and ends with a specific point.

Literature Review

It first considers the importance of the major area being investigated, primarily to provide the reader with a frame of reference from which to consider your work. Then,

within the chosen area, it identifies a gap in our knowledge, or a precise question, or a particular controversy. Finally, it pinpoints the intended value of the present research. New approaches and assumptions on which the work is based should also be identified at this point.

Materials & Methods

The *Materials & Methods* section consists of three sets of descriptions — those of the procedures, subjects and equipment used during the study. All three are traditionally given in sufficient detail to allow a competent researcher to duplicate the whole study. There are a number of ways of simplifying this task.

The first is to name but not describe commercially available equipment and well-known procedures. Specially built equipment must of course be described in detail, though they can often be illustrated with simple figures.

Another approach that can eliminate much trivia is to focus on the animal/plant material rather than on your activities. If the procedures are long and complex, they can often be succinctly presented in tables and/or figures. Commonly omitted information in experimental studies includes (i) precautions needed to ensure safety of the workers or accuracy of the data, (ii) preliminary experiments, (iii) advantages of the chosen design over related designs, and (iv) purity of the chemicals used.

Results

At first glance, an ideal *Results* section would be one that presents all the data in a completely objective manner. This is rarely possible. The major problem is that 'raw' data collected directly from experiments or observations seldom make sense unless summarized. The natural consequences of using summaries are a loss of precision in the information and some more or less subjective choices of summarizing techniques. Another departure from the ideal occurs when, for a number of possible reasons, some data must be excluded. Because of these qualifications, a good *Results* section should contain data that have been carefully but not overly simplified and are presented with as little interpretation as practicable.

A typical *Results* section is organized into discrete subunits without any overall order. An improvement would be to present the subunits in some logical and obvious pattern, such as chronological order, or from the most general to the most specific (e.g., from the simplest to the more complex analyses). An alternative improvement would be preface the *Results* with a description of the planned layout of the subunits.

Within each subunit, much data can be summarized within tables and figures. Doing so has several advantages. Tables and figures require less space than text for an equivalent amount of data; and their content is more easily deciphered. For example, a paragraph can begin with "Figure 3 shows ..." and then proceed to identify the major aspects of the figure.

<u>Tables, Figures and Plates</u>

Tables, figures and plates (photographs) should provide information that cannot be conveniently given in the text. Each must be accompanied by a legend that makes the figure understandable without reference to the text. The most common problem is poor

labelling. Another is excessive information — Are the important data obvious to an informed reader?

Discussion

Data presented in the *Results* section are **critically discussed** here in relation to each other, to the results of other studies and to the proposed hypothesis (if any). These relationships are rarely so straight-forward that only one conclusion is possible. They must, therefore, be interpreted. But the 'interpretations' are not as subjective and arbitrary as the word implies: the arguments must be logical and firmly based on facts.

There are several elements to a good discussion. One is a brief introductory paragraph that refers to the problem raised in the *Introduction* and states how the results will be discussed. Lack of a preface or of any obvious order in the discussion's contents is a very common mistake. Another element is consideration of all subunits of the *Results*. Failure to do so is a surprisingly frequent error. A third feature of good discussions is that they never gloss over contradictory or apparently uninterpretable data. They also point out faults in the research design used. Another element is full recognition of the relevant findings and hypotheses of other researchers. And, lastly, speculations are given but only when they suggest testable hypotheses or fruitful observations. The discussion can end with suggestions for future work.

Appendices

Appendices are reserved for materials that are not strictly necessary for the presentation and interpretation of the data but may be useful to other researchers in duplicating the study, reanalyzing the data, avoiding time-consuming errors when conducting similar studies, etc. Examples of the type of material that can be included are data pro forma, computer programs, preliminary experiments and supplementary statistical data. Raw data should not be included. Like the *Introduction and Literature Review are* frequently 'exploited' for 'padding' the thesis.

A Schedule for Writing - Preparation of the thesis may be divided into four basic steps.

The first step is to decide, on the basis of the format given above, where the various bits of information go. This is usually a simple task.

The next stage of writing the major sections is the most challenging. The key is order. Can the information be framed within some logical pattern? Only the *Introduction* has a generally accepted form, the pyramid structure; so it is up to you to find patterns for the other sections. At this stage, you should prepare an ordered outline of each section — start with the easiest section, which is usually the *Materials and Methods*. Then rapidly write a 'rough draft' based on the outline and on tables and figures of data. After a readable (but not polished) draft has been completed, ask your supervisor to evaluate the overall organization (and analyses, if this has not already been done). Examine the criticisms carefully, not only for specific improvements but also for general rules.

The third step is to re-write the thesis with the useful criticisms included. An important problem is an absence of continuity between sections. This is not surprising since students commonly write each section separately and only bring all the parts together for the final draft. The solution is to treat the thesis as a single unit immediately after

rough drafts of the sections have been completed. In other words, after receiving the criticisms from your supervisor, you should check the thesis from beginning to end.

The last stage is to seek further criticisms from your supervisor, but this time on all aspects of the work, including the grammar — remember that the thesis is a form of communication in the medium of English.

The following are some specific hints to help you write better science:

1. Vary the length of sentences within paragraphs.

2. Avoid slang, abbreviations, foreign words, the over-worked word 'however' and plural pronouns (e.g., we).

3. Use synonyms frequently to avoid sounding repetitious. For example, 'research' can be replaced with 'study', 'investigation' or 'work'.

4. Use short common words in preference to long uncommon words.

5. Use the present tense when discussing general facts or concepts, but the past tense for specific results.

6. Consult a dictionary, thesaurus and manual of English usage (e.g., *Fowler's Modern English Usage*) frequently.

7. Use concrete examples to illustrate abstract ideas.

8. Practice speaking parts of the thesis.

9. Use double quotation marks (") only for words or sentences quoted within another quote (that has been identified by single quotation marks ('); e.g., Gould (1982) states 'The reductionistic drive of scientists has resulted in many attempts to explain "motivation"as a unitary process.'