

Preparing Exam Papers in L^AT_EX

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April 21, 2015

Overview

- 1 Prelude
- 2 Advantages of \LaTeX for Exams
- 3 Using \LaTeX Template
- 4 Demo
- 5 Possible Outcomes
- 6 Conclusions

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- The learning curve may be challenging, but over a long run, it saves us precious time.
- Only basic \LaTeX knowledge is necessary to use this template (will be **free** for those who attend this talk).
- This template has been improved for **many** times by myself, used in three modules up to now.

Introduction

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Quick Look at The Exam Template

The screenshot shows a XeLaTeX editor window titled 'Exam_Template.tex'. The left pane displays the source code, and the right pane shows the rendered PDF output.

```
1 %This document is created from ground up by Francis T.O. Ting,  
2 %Department of Electrical and Electronic Engineering, Xi'an Jiaotong-  
3 %Liverpool University, Jiangsu Province, P.R. China.  
4  
5 %Please send your suggestions for improvement to toting@xjtlu.edu.cn  
6  
7 %This file has been compiled successfully using pdfLaTeX typesetter.  
8  
9 \documentclass[12pt]{exam}  
10  
11 \usepackage{xcolor, graphics}  
12 \usepackage{amsmath} %For Maths Equations  
13 \usepackage{comment} %For \begin{comment}...\end{comment}  
14 \usepackage{enumerate}  
15 \usepackage{ifthen} %This package determines which paper, either the  
16 %Final or the Resit  
17  
18 \begin{document}  
19  
20 %*****  
21 %Change only this part, and LaTeX will take care of the formatting !!!  
22 \printanswers %\printanswers or \noprintanswers  
23 \newcommand{\selectexam}{Final} %Change to Final or Resit  
24 \newcommand{\modulecode}{EEE 103}  
25 \newcommand{\examiner}{T.O.~Ting}  
26 \newcommand{\department}{Electrical \& Electronic Engineering}  
27 \newcommand{\phone}{1416}  
28 \newcommand{\examyyear}{14/15}  
29 \newcommand{\semester}{1}  
30 \newcommand{\studentyear}{2}  
31 \newcommand{\moduletitle}{Electrical Circuits 1}  
32 \newcommand{\hour}{3}  
33 \newcommand{\papercode}{\textcolor{blue}{\modulecode/\examyyear/S  
34 %semester/\selectexam}}  
35 %*****  
36 %*****
```

The rendered PDF on the right features a table at the top:

Paper Code	Examiner	Department	Ext
EEE 103	T.O. Ting	Electrical & Electronic Engineering	1416

Below the table is the Xi'an Jiaotong-Liverpool University logo and name in Chinese: 西交利物浦大学. The exam details are:

2014/15 Semester 1 - Final Exam
Bachelor Degree - Year 2
Electrical Circuits 1
Time Allowed : 3 Hours

Instructions to Candidates

1. The total mark available is 100 marks.
2. The mark allocated for each question is at the right column.
3. Answer ALL questions. Each question accounts for 20 marks.
4. Only the university approved calculator – Casio F882ES/83ES calculators are allowed.
5. Please write down your solution in the answer script provided.
6. Answer for each question should start on a NEW page.

Figure: Exam Template

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Advantages

Convenient

- Working on just **one** document, instead of four.
- Numbering are automatic (for tables, figures, and questions).
- Equations are easy in \LaTeX , avoiding proprietary MathType.
- Embeds comment to a question easily.

Focus & Time-saving

Helps to focus on the content. Over a long run, the time spend on formatting is almost **zero**!

Elegant

Portrays equations in elegant and convenient manner.

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Only modify these parts

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30 \newcommand {\hour}{3}
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```

Figure: Main Parts for Modification

Only modify these parts

```
19 %change only this part, and Latex will take care  
20 \printanswers %\printanswers or \noprintanswers  
21 \newcommand {\selectexam}{Resit} %Change to Resi
```

Figure: Either “printanswers” or “noprintanswers” for desired output

Example (Start A Question)

```
\begin{question}  
\newpage\question[20] %Question 1  
...  
\newpage\question[20] %Question 2  
...  
\end{question}
```

Example (Start A Solution)

```
\begin{solution}  
...  
\end{solution}
```

Example (Start A Sub-question)

```
\newpage\question[20]
```

Referring to Figure `\ref{fig11_31}`, answer the following questions:

```
\begin{parts}
```

```
\part [10] What load impedance  $Z_L$  will draw the maximum average power from the source?
```

```
\part[10] Calculate the maximum average power supplied to the load.
```

```
\end{parts}
```

Question 4 (20 points)

Referring to Figure 5, answer the following questions:

- (a) What load impedance Z_L will draw the maximum average power from the source? [10]
- (b) Calculate the maximum average power supplied to the load. [10]

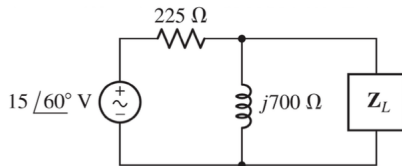


Figure 5: Circuit for question 4

Figure: Example of sub-question

Example (Sub-sub-question)

```
\newpage\question[20]
```

```
\begin{parts}
```

```
\part Refer to Figure \ref{fig3a}. Given that  
$i_L=\cos(10^6t)$ A.
```

```
\begin{subparts}
```

```
\subpart[5] Determine  $v_c(t)$ .
```

```
\subpart[5] Determine  $i_s(t)$ .
```

```
\end{subparts}
```


Question 3 (20 points)

- (a) Refer to Figure 5. Given that $i_L = \cos(10^6 t)$ A.
- Determine $v_c(t)$.
 - Determine $i_s(t)$.

[5]

[5]

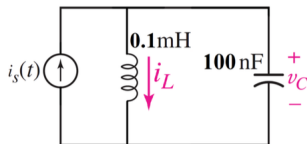


Figure 5: Circuit for question 3(a)

Figure: Example of sub-sub-question

Example (Solution)

```
\newcommand\cc{\color{red}} %cc is change color

\begin{solution}

\begin{eqnarray*}
V_{th}&=&\frac{j700}{225+j700}(15\angle 60^\circ) \\
&=&14.28\angle 78^\circ, \text{\tx{V\quad\cc 5 marks}}\\
Z_{th}&=&\frac{225(j700)}{225+j700} \\
&=&204+j65.5, \text{\Omega\quad\tx{\cc 5 marks}}\\
\end{eqnarray*}

\end{solution}
```

Solution:

$$V_{th} = \frac{j700}{225 + j700}(15\angle 60^\circ) = 14.28\angle 78^\circ \text{ V} \quad 5 \text{ marks}$$

$$Z_{th} = \frac{225(j700)}{225 + j700} = 204 + j65.5 \Omega \quad 5 \text{ marks}$$

Figure: Example of a solution

Note: A solution will be encapsulated automatically in a box

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A Short Demonstration



More Information

- ⇒ This template utilized the “exam.cls,” used by many universities to typeset professional exam papers.
- ⇒ More information can be found in “examdoc.pdf.”
- ⇒ Many more details on the typesetting and handy tools are elaborated in this document.

Five HOWs

- ① How to prepare beautiful exam papers?
- ② How to get good feedback from moderators?
- ③ How to avoid working on four documents in exam preparation?
- ④ How to update your paper, after moderation, in a very short time?
- ⑤ How to embed hidden comments in your exam paper?

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Comment from Liverpool's Moderator / External Examiner

- Both Final and Resist exams are **well written papers** and clearly assess the learning outcomes of the module.
- The language used in the papers is clear and the diagrams use **standard symbols and units**. I did not find any **typographical** or grammatical errors.
- The paper is of a suitable **national standard**, with the English being of a high quality in both the examination and in the solutions. The resist exam and solutions are of a similar high standard.

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- ⇒ In a long run, \LaTeX saves our precious time.
- ⇒ The outlook from \LaTeX is appealing and elegant.
- ⇒ Enjoy using \LaTeX for your exams!

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The End