Working Together in the Classroom: An Analytical Approach

Master of Science in Physics

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May, 2020

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By

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A thesis submitted in partial fulfillment of the requirement for degree of

Master of Science in Physics

Supervisor: Dr. Muhammad Aslam Khan

Co-Supervisor: Engr. Muhammad Arslan Yousaf

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I **XYZ** hereby state that my MS thesis titled *"Working Together in the Classroom: An Analytical Approach "* is my own work and has not been submitted previously by me for taking any degree from Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan or anywhere else in the country/world. At any time if my statement is found to be incorrect even after my graduation the university has the right to withdraw my MS degree.

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This is to certify that the research work presented in this thesis, entitled *"Working Together in the Classroom: An Analytical Approach "* was conducted by **XYZ** under the supervision of **Dr. Muhammad Aslam Khan** and **Engr. Muhammad Arslan Yousaf**.

This thesis is submitted to the Department of Physics, Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan in partial fulfillment of the requirements for the degree of Master of Science in field of Physics.

External Examiner	Signature and Date
Co-Supervisor	Signature and Date
Supervisor	Signature and Date
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Dean of Faculty	Signature and Date

Acknowledgments

The help, guidance and sponsorship of the mentor (s), teacher(s), colleague(s), relative(s) for the conduct of research and composition of thesis / dissertation may be a acknowledged by the author. It shall not be exceeded than a page.

XYZ

Abstract

This section is a summary of the research report/ thesis/dissertation which is developed with an objective to give the reader a quick overview of the problem, thesis/dissertation objectives, methodology, and the findings. Abstract should contain at least 250 words and a maximum of 300 words.

Keywords: Keywords1, Keywords2, Keywords3

Contents

List of Figures

List of Tables

1 Introduction

First chapter should clearly state motivation, explain significance and describe the general theoretical aspect of the study. Avoid repetition or duplication of ideas. At the end of the chapter describe the outline of thesis.

1.1 General Instructions About Thesis Template

1.1.1 Page format and page limit

Left margin 1.5 while top, bottom and right margins 01 inch each. The text shall be fully justified and the paragraph should not be indented. The heading and sub-heading of each word except prepositions and articles shall be capital. The sub-sub-heading of first word shall be capital and rest all in small case.

The page limit for MS/MPhil thesis is minimum 60 pages altogether.

1.1.2 Font size and style

12pt text font size, Arial

1.1.3 Tables and figure legends

The legends of the tables should be written on the top of the table, while figure legends at the bottom of the figure.

1.1.4 Paper size and quality

Thesis shall be submitted on A-4 size paper weighing not less than 85 gram. Use only one side of the page for printing.

1.1.5 Thesis binding

Thesis binding (colour title page) will be on art paper. The art paper weight will be finalized in the upcoming meeting of the GPC (25th meeting).

Spine of the thesis should display "MS Major" (i.e MS PHYSICS) on top along the length of spine, candidate's name in the middle along the length of spine, and year of submission at the bottom along the length of thesis. It should be in capital letters with 16 fonts bold (Arial).

1.1.6 Reference style

The approved reference style is American Psychological Association (APA) 6th edition. APA requires that information be cited in 2 different ways citation in the text and in a reference list at the end of the thesis. Citation of one reference with one author within or at the end of sentence is like this (Volokitin, 2020). Start of Sentence is like this. Volokitin (2020) has presented this study. One reference by two authors: Within or End of Sentence: In this study the authors (Bramberger & De Vega, 2020) has reported. Start of Sentence is like this. Bramberger and De Vega (2020) has presented this study. One reference by three to five authors is like this (Huang, Yin, Zhu, Zhang, & Guo, 2019). Start of the Sentence: Huang et al. (2019) has presented this study. One reference by six or more authors is like this (Wang et al., 2019). Start of the Sentence: Wang et al. (2019). has presented this study.Multiple references is like this. All citation: In these studies the authors (Volokitin, 2020; Bramberger & De Vega, 2020; Huang et al., 2019) have presented.

1. Internal combustion

2. External combustion

3. Fuel cells

Or

- Internal combustion

- External combustion

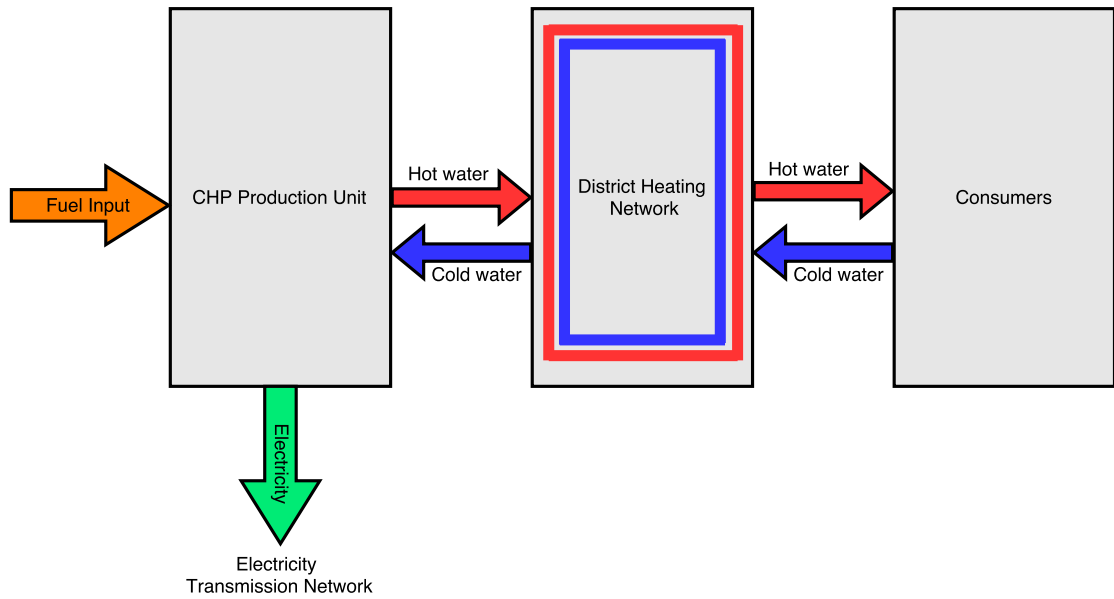- Fuel cells

As given in equation 1.1

Figure 1.1: CHP system

$$\text{Per unit energy cost} = \frac{\text{Total fuel input}}{\text{Total energy produced}} = 1.058C \tag{1.1}$$

$$P_{th} = \dot{V}_w \, \rho \, c \, (T_{in} - T_{out}) \tag{1.2}$$

$$p_{bmep} = \frac{\text{brake work output}}{\text{swept volume}} = \frac{2\pi \, n_R \, T}{V_d}$$

Table 1.1: ICE specifications

Engine specification	Units	Value
Gas engine	Manufacturer	Toyota
	Engine type	1KS
Operation		4 stroke
Number/arrangements of cylinders		3/in line
Bore/Stroke	mm	72/78
Cubic capacity	l	1
Speed	rpm	1500
Compression ratio		12:1
Lubricating oil pan capacity	l	15
Lubricating oil consumption	Average g/h	1.5
Gas flow pressure	mbar	20-50

$$BS(t) = \begin{cases} BS_{max} & \text{if } BS(t-1) \geq BS_{max} \\ BS_0 + \int\limits_{t0}^{t} P_t(t) & \text{if } 0 \leq BS(t) < BS_{max} \end{cases} \tag{1.3}$$

$$BS(t) = \begin{cases} BS_{max} & \text{if } BS(t-1) \geq BS_{max} \\ BS_0 + \int\limits_{t0}^{t} (P_t(t) - Q_{th}(t)) & \text{if } P_t(t) > Q_{th} \\ BS(t-1) & \text{otherwise} \end{cases} \tag{1.4}$$

2 Literature Review

This chapter should describe the relevant literature review of the study.

3 Material and Methods/Model and Equations/Modelling

The title of the chapter 3 may be defined as per study requirements. The chapter should describe the detail experimental set-up, methodology and procedure. However experimental set-up may be replaced by suitable title where-ever applicable.

4 Results and Discussion

This chapter should explain all results obtain in the study followed by point to point discussion supported with the literature.

5 Conclusion

This chapter describes concise statement of research which includes methodology, results, conclusion drawn.

References

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