SBS5311 HVACR II

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Tutorial Exercise 02:
Calculations in Refrigeration and Heat Pump Systems

Introduction

After learning the underlying principles of refrigeration cycles and the characteristics of typical refrigerant-based HVAC systems, this tutorial exercise allows the students to study and develop practical skills for the calculations in refrigeration and heat pump systems.

Objectives

- To study the typical calculations in refrigeration and heat pump systems through worked examples
- To develop practical skills for the calculations and analysis of those systems

Methodology

1. Study of Worked Examples

Students should read carefully the following selected worked examples to understand the calculation methods and approach.

- Joel, R., 1996. *Basic Engineering Thermodynamics*, Fifth Edition, Longman/Addison Welley, Essex, England.
    - Chapter 18. Refrigeration, pp. 612-616
        - Example 18.1 Vapour compression refrigerator
        - Example 18.2 Simple heat pump
- Rajput, R. K., 2007. *Engineering Thermodynamics*, Third Edition, SI unit version, Laxmi Publications (P) Ltd, New Delhi, India.
    - Chapter 14. Refrigeration Cycles, pp. 744-764
        - Examples 14.12 to 14.27

2. Online Learning

Using the following online learning tool, students should develop a better understanding of refrigeration and heat pump systems with clearly explained calculation examples.

- LearnThermo.com http://www.learnthermo.com/
    - Ch 10 - Refrigeration and Heat Pump Systems
      http://www.learnthermo.com/T1-tutorial/ch10/intro.php
        - Lesson 10A - Introduction to Refrigeration Systems
        - Lesson 10B - Vapor-Compression Refrig. Systems
        - Lesson 10C - Enhanced V-C Refrig. Systems
        - Lesson 10D - Heat Pump Systems