<table>
<thead>
<tr>
<th>Question</th>
<th>Points</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>20/20</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10/20</td>
<td>-10 points: The table cited for 2b is for the United States, not all of North America.</td>
</tr>
<tr>
<td>3</td>
<td>20/20</td>
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<tr>
<td>4</td>
<td>20/20</td>
<td>You included the ISBN for the book instead of the call number. The call number for the print book is TP1175.R43 R83 2017</td>
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<tr>
<td>5</td>
<td>20/20</td>
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</tbody>
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**Extra Credit:**

**Missed Points:**

**Final Score:** 90

**Additional Comments:**
1. In an effort to bring healthy snacks to more people at a local farmer’s market, your team is designing a pedal powered smoothie machine using an old bike. To make your pedaling machine more efficient, you need to use a handbook to know more about muscle-generated power.

   a. What is the equation for **useful power production** by pedaling (legs only) for working in durations between 20 to 120 s?
      i. $hp = 2.8t^{0.40}$
   
   b. What is the equation for **useful power production** with pedaling efforts from 1 to about 100 minutes?
      i. $hp = 0.53 - 0.13\log t$

2. It would be helpful to get some statistics on the size of the global telemedicine technologies industry.

   a. What region had the largest market in telemedicine technology in 2019? **North America** (which is mainly USA) was the largest region in the global telemedicine services market, accounting for 43.9% of the total in 2019

   **Citation:** “Global Telemedicine Services Market Report Opportunities And Strategies”. *The Business Research Company.*
   https://www.thebusinessresearchcompany.com/report/telemedicine-services-market
   (Accessed: 15-Sep-2021)

   b. What is the projected size of the region’s market in 2024? **$29.8 billion**

   **Citation:** “Total telemedicine market in the United States from 2014 to 2025”. *Grand View Research, Statista estimates.*

3. You need to find a partner to help develop and commercialize (hopefully) your new product idea for an automotive sensor. An industry expert has suggested to you that Allegro Microsystems, Inc. might be a potential partner. Before contacting them, learn more about Allegro Microsystems, Inc

Uncover the following facts about the company’s operations:

   a. The year when the company was founded or incorporated (or changed ownership)
      i. The company was founded on **March 28th, 2013**.
   
   b. The address of their headquarters
      i. The address of their headquarters is **955 Perimeter Rd, Manchester, New Hampshire, 03103-3353, United States**.
   
   c. Total number of employees worldwide (i.e., all sites, if possible)
      i. The total number of employees at all sites as of March 26th, 2021 is **3,874**.
d. Latest revenue (sales) figures
   i. The total annual sales as of March 26th, 2021 is about \textbf{591 million USD}.

e. What is US 8-Digit SIC (Standard Industrial Classification) code for their primary industry?
   i. The US 8-Digit SIC is \textbf{36740000} (Semiconductors and related devices).

4. You would like to learn more about \textbf{plastics recycling}, and you know that the right book can provide a good summary on this topic. Use the resources found on the 2.009 Guide (https://libguides.mit.edu/2-009) to answer the following questions:

   a. Find a general book on \textbf{plastics recycling}, available in the MIT Libraries. Provide a good citation for the book, including the library call # at the end of the citation and which library has the item (Dewey, Rotch, Barker, etc.) or if it is an eBook.
      ii. 2017020785 Hayden Library and eBook

   b. To find more specific information, you want to read a scholarly article on the narrower topic of \textbf{plastics recycling in the beverage industry}.
      i. Use a database to search for an English language journal article on this topic published in 2010-2021. Provide a good citation for the article, and include the bibliographic database you used to find the citation. \textit{Found in Science Direct Database}
      ii. Does MIT have a print subscription to this journal for the year that the article was published? If yes, in which library is it held? Does MIT have access to an electronic version of this article?
         1. MIT does not have print access for this journal in the year of 2011, but does have it for other years previous, before version 28. MIT has an electronic version of the article through Science Direct online version of the journal, found at https://www.sciencedirect.com/science/article/pii/S0921344911000656.

5. You want to make sure your design or project idea is unique before you take it to a company or customer for production. Check the patent literature, and find one granted (not an application) United States utility patent for \textbf{wireless microphone}.

   a. What is the patent title?
      i. Wireless microphone comprising a plurality of antennas

   b. What is the patent number? (Tip: numbers starting with D, e.g. D593812, are design patents, not utility patents. Numbers starting with the year, e.g. US20060201950, are applications, not granted patents)
i. US10893349B2

c. Who is the assignee? The inventor?
   i. It is assigned to ALTEROS, INC and Audio-Technica U.S., Inc.
   ii. The inventors are Fair, Brian K.; Green, III, Robert T.; Green, Jacquelynn A.

d. Provide at least one classification code assigned to this patent (number and name, example:
   446/486: Amusement Devices: Toys/ Resilient toy or actuator, OR A63F9/00: Sports;Games;Amusements: Card, board or roulette games; indoor games using small moving playing bodies, miscellaneous games: games not otherwise provided for)
   i. H01Q1/00: Details of, or arrangements associated with, antennas

e. Where did you find this patent/what database did you use?
   i. Espacenet Patent search. Searched for “wireless microphone”

Citation: Fair, Brian K, Green, III, Robert T., and Green, Jacquelynn A., 2021, “Wireless microphone comprising a plurality of antennas”, U.S. Patent No. 10893349


Problem 3 - Orbis BVD, “Allegro Microsystems, Inc.,”