AEE 498 Take home Midterm Exam Paper

Online Sunday, 10 May 2020

Due Monday, 11 May 2020

Instructions

- Please write your answers on paper with pen/pencil, sign it at the top with your name and number.
- Please answer the questions in order.
- Scan and upload your answer sheet as MS Teams assignment.
- The use of the Internet and other sources are allowed and encouraged, but do not copy pieces of text directly from the articles discussed or online materials. Copying directly from published materials is not acceptable.
- Group work is strictly not allowed. You will be questioned if group work is detected, and your answer sheet may be deemed void.
- Each question is 10 points worth. This exam will constitute 25% of your end of term mark.

Questions

1. List important current innovations taking place in the aviation industry.

2. Aside from the current pandemic, what are the biggest problems the aviation industry is facing in the next decades. Explain briefly.

3. How does the current pandemic affect commercial airliners and aerospace engineering business currently? What do you think about the longer term effects of the pandemic? Explain briefly by stating relevant facts.

4. The future of flight report was written before the covid-19 pandemic in May 2019. How much **growth rate** did the report forecasted in air traffic in the coming two decades? How many more aircraft and pilots would be required according to this estimate?

   Now answer the above questions, assuming a more likely growth rate considering the adverse effects of the pandemic.

5. Name the main aviation/aerospace companies in the following fields of operation: Manufacturing, Turbo fan engine manufacturers, electrification.

6. Which parts of modern aircraft are built with composites and why composites are preferred? Are there any disadvantages also?

7. Grazia Vittadini of Airbus thinks that the key to the future of aircraft technology is connectivity. Explain what you understand by this statement.

8. What is the cost of Li-ion batteries and how much energy they store per kg?

9. How much energy is used typically for a transatlantic flight? What would be the weight of Li-ion batteries for such a flight?

10. What are the advantages of electric propulsion?