UNIVERSITY OF TORONTO

Faculty of Applied Science and Engineering

Final Examinations, December 2001

HPS 282F - History of Technology and Engineering

Examiner - B. Hall

DIRECTIONS: This examination is divided into three parts, Part A (Short Answer Questions), Part B (Short Essay Questions), and Part C (Long Essay Questions). You must answer ALL SEVEN questions in section A for full credit; you should choose ONE of the two questions in Part B and ONE of the two question in Part C. Part A = 10 points, Part B = 15 points, and Part C = 20 points. The total combined value of this examination = 45 points. You may work on these parts in any order you choose.

Part A (7 Short-Answer Questions) 10 Points

Answer all of the following to the limits required. You may use point form, outlines, or diagrams where needed. Each answer would normally take about one-half page of an answer booklet. The value of each question is one point unless a different value is stated immediately following the question. This set of questions covers material in the course SINCE the mid-term. Please put your name and the label "Part A" on the answer booklet cover.

1. What happened to Edwin Howard Armstrong at the end of his life?

2. What three specific goals was the strategic bombing campaign of World War II supposed to meet? How well did it do so? (2 points)

3. Historically, how could anyone claim that NASA's Space Shuttle Program has harmed space science rather than assisting it?

4. Why does Thomas P. Hughes call Samuel Insull a "system builder"? (2 Points)

Part A (cont.)

3. Explain historically why the Boeing 747 (see graphic) has that unique bulge at the top of the fuselage with the fight deck (pilot's windows) mounted so high off the ground.

5. Which of the superpowers introduced Multiple Independent Re-entry Vehicles (MIRVs) to Inter-Continental Ballistic Missiles (ICBMs)? Which superpower came to have the advantage once MIRVing was operational?.

7. MATCHING. (2 POINTS): On the left is a series of 10 personal names. On the right a list of 20 items. Each name on the left is most closely associated with TWO items on the right. Match each name letter with the two numbers that correspond to the closest association on the list. Thus if you think George Westinghouse invented the UNIVAC driven by a Light water reactor you would write E - 1 - 12. Each correctly associated item is worth 0.1 points. .

Names	Items
A. Adm. Hyman Rickover	1. UNIVAC
	2. U.S.S. Nautilus
B. David Sarnoff	3. Triode vacuum tube
	4. Pan American Airways
C. Ed Roberts	5. The Chief Designer
	6. Sputnik 1
D. Juan Trippe	7. National Broadcasting Corp. (NBC)
	8. Turbojet Pioneer
E. Frank Whittle	9. Radio Corporation of America (RCA)
	10. Regenerative circuit
F. Presper Eckert	11. Manhattan Project
	12. Light water reactor
G. Robert Oppenheimer	13. General Advisory Committee (GAC)
	14. Boeing 707
H. Elmer Sperry	15. First "personal" computer
	16. ENIAC
I. Lee DeForest	17. Ship Stabilizers
	18. Struggling Ousider
J. Sergei P. Korolev	19. Altair 8800
	20. Gyrocompass

Part B (Short Essay Questions) 15 Points

Choose ONE of the questions below and write a short essay on it. Essays will normally be about 2 pages in length, but there is no required maximum or minimum. Please use a different answer book for this part of the exam. Please put your name on the cover of the answer booklet and the number of the essay topic you select (B1 or B2). Write on one side of the page only; this means you can use the other side for rough notes. We will grade essays submitted in outline form if you wish. Criteria for grading include organization of thoughts, logical expression, and use of examples from the course.

B1. How well does the system of patents we live under seem to work, historically considered? That is, does the system stimulate innovation while protecting and rewarding individual inventive genius? Or does it protect corporate interests at the expense of individual interests? Or is it perhaps not working for the benefit of anyone at all today? Please support your answer with historical examples, and especially examples from Thomas Hughes, American Genesis.

B2. In your opinion are women affected by technological changes in different ways than men are? We are speaking generally, of course, but in the period covered by this course it would seem that women's lives have been changed by technology in different ways than men's lives. Please comment on these differences, using examples from the course lectures and readings and American Genesis.

END OF PART B

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Part C | (Longer Essay Questions) | 25 Points

Choose ONE of the questions below and write an essay on it. Essays will normally be about 5 pages in length, but there is no required maximum or minimum. Please use a separate answer book here from that which you used for Part A and Part B. Please indicate the number of the essay topic you select (C1 or C2). Write on one side of the page only. Don't forget to put your name on the answer booklet cover.

C1. We have all heard the phrase, "Necessity is the mother of invention," indicating that some sort of needs (social, economic, military or political) stimulate us to innovate in our technology. Could we say with equal justice that "invention is the Mother of Necessity." That is, do not new technologies sometimes create the sense that they are so "necessary" that we wonder how we ever got so far without them. How do these originally "un-needed" technologies come out to seem so important or significant in the course of time? Again, examples, examples, and more examples will make a better answer.

C2. Technologies sometimes look as if they will promise fundamental changes in the way we live (think of the promise of cheap electricity through nuclear power, for example, or the idea of an aircraft for every home), yet only some technologies actually have a deep impact on daily life (cheap air freight, for example, or mass-produced automobiles). What are the properties or qualities that set apart some technologies as genuinely effective agents that shape out lives while others only prove to be false promises of change? As always, historical examples are required in answering this question, and don't forget American Genesis.

END OF PART C

END OF EXAMINATION