1. The industrial Revolution.

As a whole, people did pretty miserably on this question.

Technological changes (not science based) that you needed to note:

   a. Steam engines: the Watt steam engine was an improvement on the earlier Newcomen steam engine, which in turn was an improvement on an earlier steam engine, etc. The first steam engine was invented in Ancient Greece, **not** in England.

   b. Textiles: Many important innovations were finally used in the textile industry in England during this time. The spinning Jenny, the mule and the waterloom all streamlined each part of the wool, and later cotton, spinning process and changed what quality wool or cotton could be used in production.

   c. Innovations: The first IR was not marked by inventions. It was not marked by the scientific revolution. Instead it was marked by innovating and adapting previous inventions so that they were actually used in manufacturing.

   d. Learning by doing: Basically what it sounds like. Workers became more productive by doing the same thing over and over, and organization improved overall once people saw what was going on and how things could be improved.

Firm changes:

   a. Factories: You needed to note that for the first time factories appeared. It seems obvious, but many people did not deign to mention this enormous change.

   b. Mechanization: manufacturing became mechanized.

   c. Centralization: What had previously been a “putting-out” system (this system PREDATED the first IR) became centralized into factories. This centralization allowed for better supervision, operations management and quality control. It also facilitated “learning by doing.”

   d. Team production: workers work together in teams. Sometimes this is more efficient.

   e. Increased division of labor/specialization: The putting out system had a certain amount of division of labor. However, with a centralized factory system, labor could be divided even more. Think about Adam Smith’s famous pin factory.

   f. Women and children: Contrary to many of your belief’s, women and children did not sit at home doing needle point before the industrial revolution. Instead they were productive farm workers. Women, especially, did not refrain from working until the Victorian Era. They couldn’t—society did not yet make enough to allow any hand to be idle. Only after the Industrial Revolution did per capita income begin to grow (ignoring the possible case of Sung China). The idea behind women and children moving into factories is as follows. With the Agricultural Revolution, agriculture was suddenly more productive and fewer people were needed to make more food. Thus all of a sudden a large portion of the labor force was freed up to work outside of agriculture. Men had a comparative advantage in the kind of agriculture done in England because it was strength intensive (reaping, lifting bales etc.), thus women had lower marginal products and thus lower wages than men. Thus it makes more sense for
women to be the ones spinning etc. in the new textile factories and for children to be doing the other kinds of unskilled labor because they are more productive outside of agriculture and have a higher marginal product. Since their outside wage is lower (using a different economic model), they can also be paid less than men, which makes factory workers happier.

Market changes:
   a. Population increases (because of more food) means that there are more people to buy products. There are more people to move into cities to buy products too.
   b. Transportation improvements such as canals, improved roads etc. allowed for better transportation thus leading to larger markets. (Faster transportation => stuff spoils slower and can go farther in a smaller amount of time)

Why Britain first:
   a. Britain had good property rights and other institutions, unlike China (see North)
   b. Britain, unlike Italy, had lots of coal (good factor endowment) and other factor endowments (rivers…)
   c. The Agricultural Revolution freed up a large portion of the labor force (see women and children) to work outside of agriculture and fed people so population could increase (of course, this begs the question of Why not France?)
   d. Better shipping through ocean, canals, rivers etc. Britain was an island and had both the ocean and a good fleet of ships. It had recently built canals (and fixed up the roads) and had a number of nice rivers. This led to lower transportation costs than other countries.

2. South and North and different paths:
Another question that almost everybody did miserably on. The numbers below correspond to the circled numbers in the “missing” section of your answer book.
   1. The income in the South was doing well before the Civil War. From 1840-1860 it was growing at 1.7% per year vs. 1.3% per year in the North.
   2. The rate of return on slaves was high. Fogel and Engerman estimate 10% in relative efficiency calculations. They argue that the South could not have done better without slaves.
   3. The gang system with its factory style production was what gave the South its advantage.
   4. Some people have argued that slavery was just conspicuous consumption on the part of slave owners. Evidence shows that it was an incredibly viable way for a plantation to manage agribusiness.
   5. The South was agricultural. The North was starting to become industrialized.
   6. Why didn’t the South put its slaves into manufacturing if manufacturing was so great (they could rent out their slaves)? The traditional story is that slave owners were afraid of allowing slaves the autonomy that would come from factory work. They thought they might lose control of the slaves that way.
7. However, Fogel argues that the above isn’t the case at all. Instead Southerners had a comparative advantage in agriculture. It was good at agriculture and highly profitable, but the North had to resort to other means of production.

8. Goldin and Sokoloff argued that because wages of women and children in northern agriculture were low (they weren’t very productive because there wasn’t much that wasn’t strength intensive), therefore the North industrializes first because it has cheap factors of production. In the South, women and children are more productive in agriculture and cost too much to put into factories. This story is based on factor endowments rather than slavery.

9. Industrialization and urbanization are not necessarily good things. In the large cities in the North, sanitation and health were not good. Of course, health on plantations was probably not that great if you include the health of poor children.

10. After the Civil War, the South experienced negative rates of growth from 1860 to 1880 and has taken a long time to catch up.

11. Why? Fogel argues that once the gang system was abolished agriculture was not as productive. It could be that the South’s economy was too skewed towards agriculture because of slavery and could not adjust after slavery ended. In the absence of slavery, they too might have had nascent manufacturing.

12. Other views are as follows: When cotton supplies were cut off because of the Civil War, Egypt and China realized they could fill the demand and thus provided competition that the South had not had before for cotton. World raw cotton prices dropped. Of course, the South had higher quality cotton, so this might not be an issue. Increased demand for leisure for former slaves meant that slaves did not work as many hours in a day. This argument is not as strong as their refusing to work in gang labor. The South had large amounts of capital destroyed in the war. However, other war-torn places have been able to rebuild to be better than before.

13. A legacy of slavery was a poorly educated population (90-95% of the freed slaves were illiterate and, as you will be learning in “Race and Schooling in the South,” intergenerational lag is important) and racism led to segregation and limited investment in black children’s education.

Many of you seem to have grasped modern arguments by Fogel and Goldin and Sokoloff, but are not aware of the traditional views on these issues—that is, the traditional question is: “After the Civil War, the South did really badly. Industrialization was a great thing for the North—why didn’t the South just copy the North either before or after the Civil War?” Instead, many of you seem to be looking at it from a “Why was the North so different?” perspective.

3. Malthusian theory. Finally a question most of you did well on.
   a. Malthus believed that population growth was geometric (he got this from looking at populations in the US) and that food growth was arithmetic (that is, he believed that food production did increase with the number of workers, just not as fast as the number of workers increased). When the two lines meet, an equilibrium is reached. Or rather, when times are good, people reproduce too much and starve back to equilibrium in the way you possibly learned in 18.03.
b. Malthus believed that there were two checks that controlled population. The first was the positive check, which he believed more likely. The positive check says that famine, plagues, doom, death, despair etc. will control population.

c. The only way Malthus believed we could save ourselves from this positive check is through the preventative check. This check is controlled through fertility. Malthus thought the only way it would work would be through controlling our “animal passions,” something he believed impossible, the dour old clergyman he was. Malthus had not really heard of birth control.

d. After the 1500s there is no evidence of the positive checks. Small famines have happened, but none on a large scale and not generally because of increased fertility.

e. There is, however, evidence for the preventative check (ironically because Malthus believe this impossible, proving him doubly wrong). In England, people had to have money to live on and a place to live before they could get married. Generally places to live could only be found when places to live were vacated (by death of the previous occupants, for instance). Thus the population equilibrated itself by delayed marriage (and somehow people were able to keep from being fertile before marriage…). There is also some evidence of sponges and citrus things being used as birth control. Additionally, more modern populations have been shown to use rhythm methods etc. within marriage.

f. A modification of the Malthus hypothesis is given by Fogel. He suggests that rather than famines, there’s a chronic undernourishment. Changes in body size equilibrate the system. The system can have multiple equilibria.

g. Another modification, which added to f could arguably get us to the modern-day equilibrium is to add technical change in agriculture. Malthus was completely unaware that agriculture could become more than linearly productive. Contrary to some of your beliefs, the productivity function for agriculture was not geometric. Rather it was really complicated and piecemeal and is probably not continuously differentiable.

4. Banking—Deposit insurance.
Most people who tried this one got it mostly right. Items you missed correspond to the numbers below:

1. Deposit insurance was invented to prevent bank runs and panics. Unfortunately it also creates moral hazard because the insurance premium does not depend on the riskiness of bank assets.

2. Calomiris is your main source for this question. He notes that there are two types of deposit insurance systems. The first is the “bad” system. NY, MI and VT are antebellum examples of how not to create a deposit insurance system. They were plagued by bad supervision (mainly political) which led to worse banks being left in the deposit insurance system because the good banks didn’t want to support the free-riding lemons.

3. But deposit insurance can work if there is a system of unlimited mutual liability. IN, OH and IA are examples of how to create a good DI system. They relied on bankers to police themselves—that is bankers supervised the
insurance system and had the power to shut down bad banks. In practice they also ended up saving banks that were not in the system. Unlimited mutual liability gave strong incentives to keep track of what member banks were doing.

4. In the post bellum period, unfortunately, the states that chose DI insurance chose to model their systems after NY. Bad.

5. Branch banking, which is not a form of DI, is an alternative to DI. It spreads risk and can keep track of what member banks are doing. States with branch banking did better in terms of failure rates.

6. Lessons: deregulation of banks while leaving deposit insurance can (and did in the 1980s Savings and Loans crisis when you were mostly all just babies) lead to problems.

7. These problems can be mitigated by branch banking

8. or restructuring deposit insurance so that it includes unlimited liability.

9. You need to know a little about the time variation of the banking regimes. For 9 and 10 you need to demonstrate that you somehow understand the timing of the regimes even if you don’t label all of them.

10. First bank of the US: 1791-1811
    Second bank of the US: 1816-1836
    Free banking: 1837-1860
    National reserve banking system (gold standard): 1863-1914
    Federal reserve: 1914-present (gold standard until depression)