1)

UPS is an American shipping and supply chain management company that intends to use digital tools to synchronize its operations and logistics strategy to better meet customer needs. They ran interviews with a portion of their customers and concluded that there are two major customer experience challenges UPS need to deal with: 1) fast delivery and 2) real-time package tracking. As a chief innovation officer (CIO) at UPS:

a) **Can you propose a solution that can significantly improve the customer and stakeholder experiences and enhance efficiencies of the company operations?**
When you want to significantly improve a supply chain you'll need to collect relevant data for analysis, so my first proposal would be to track individual parts of the supply chain. You could use GPS on trucks, and software to keep track of packages in warehouses. When you have these data points you can make algorithms to optimize and shave off travel time/bottlenecks.

b) **Describe what emerging technology you will use to implement that solution?**
An emerging technology could be a real-time delivery map where trucks and packages are analyzed to get an accurate ETA. It could also use the truck's speed and location to optimize routes to avoid traffic incidents like road closures, traffic or accidents. A requirement for this technology to work would be a strong GPS to give real time status and location, it would also need a solid infrastructure of digitized maps to make driving routes smooth. Then you'd need a system capable of sifting through copious amounts of data to find the fastest routes.

c) **Define your role as a CIO within UPS?**
My role as CIO (chief information officer) would be to ensure that the IT department functions effortlessly within the organization. I would be overseeing new network and system implementations to make sure they're properly integrated with the company, and keep in line with costs and core values.

d) **If your business has a gap in the skills required to implement your innovative solution, how would you help your business to bridge that gap?**
If my business has a gap in skills required to implement my innovative solution then there's a need to invest into the relevant personnel to get them up to standards. Be it to get the workers through IT courses or get relevant certification. As a last step to get the required skills would be to hire new blood with the necessary skills.

e) The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a blueprint to achieve a better and more sustainable future for all. The SDGs were set up in 2015 by the United Nations and are intended to be achieved by 2030. **Which SDGs your digital transformation solution will positively impact and how?**
My digital transformation tackles one of the SDGs goals, namely industry, innovation and infrastructure. When you talk about infrastructure you don't often think about digitized infrastructure, and with a digitized road-map optimizations are endless. It could be used for self-driving cars/trucks down the line, reducing the ETAs by a substantial margin, as a truck could drive for 24 hours a day with only refueling and service as downtime.

2)

The COVID-19 pandemic has affected the education industry and nearly all institutions have adopted digital education approaches that make it safer for both students and teachers to meet social distancing constraints while keeping the academic standard unaffected. Major problems with remote learning are the limited access to labs and lab equipment and inability to monitor suspicious activities such as opening tabs, chat boxing in the background, picture exchange and more while students are taking home exams.

a) **Propose a digital solution to help students to collaboratively run lab experiments from their own locations while enhancing the real feeling of objects and their learning experience?**

A digital solution to help students run lab experiments from their own locations could be the use of virtual reality. Imagine a zoom call, but in virtual reality where people can walk around a classroom and interact with objects and other people.

b) **Propose a solution that can monitor students' activities during home exams such that it can provide real-time feedback to prohibit suspicious actions and enhance credibility and fairness of such exams in the future?**

My solution for monitoring students' activities during home exams would be to stream the home exam with a webcam. Although you could probably still cheat to some extent, it would deter cheating as it has real implications when caught. And it's more about making cheating as inconvenient as possible, and not just the ease of answering a discord message under the exam.

c) **Describe the emerging technologies you will use to develop these solutions?**

The emergings technologies I would use for these solutions would be VR headsets and webcams and we could take inspiration from platforms that use these technologies to great success, particularly Twitch and Metaverse.

d) **What are the challenges that might impact online learning?**

The challenges with these solutions is that it puts a heavy hardware restraint on the school/students and I would expect the return of investment would be low if not executed properly.

e) Refer to 1e), **which SDGs your digital transformation solution will positively impact and how?**

my digital transformation solution that makes a digitized class room for virtual reality, helps to create a better learning environment and by removing cheating from home exams with streaming/webcam students would find it fair. Both ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

3)

As hospitals strive to provide the right care to the right patient at the right time, healthcare providers need to do two things: evaluate patients' needs accurately and manage hospital resources effectively. Shortage in healthcare staff can lead to overworking, crowding and hence more medical errors, and patients feel neglected.

a) **Propose a digital transformation strategy to mitigate healthcare personnel staffing shortages in hospitals to lower operating costs and enhance services?**
I would propose Big data to collect information about the hospital through ecommerce, online transaction and financial transactions. With analyzing copious amounts of data we can identify patterns and trends for future use. This could be used for lowering the rate of medication errors, through patient record analysis. Would also facilitate preventive care, big data analysis could identify people to be frequenting the hospitals and create a preventive plan to keep them from returning. More accurate staffing, Big data's predictive analysis could help hospitals allocate the proper staff to deal with patients.

b) **What emerging technologies will you use to accelerate the proposed transformation?**
For Big data to be a viable option for analysis we need a tremendous amount of data points. This would come from ecommerce, online transactions and financial transactions. But another digital trend could be wearable medical devices that collect data about a person in real time. These devices could be heart rate sensors, sweat meters (for diabetics) or oximeters (for asthma).

c) **State advantages and disadvantages of implementing this solution on the cloud. State the four different cloud models?**
The advantages of implementing this solution on cloud is cheaper costs, scalability and accessibility. While the disadvantages would be privacy, as we deal with patients records and sensitive information confidentiality would be an issue.
The four different cloud models is as follows: Infrastructure as a service (IaaS), platform as a service (PaaS), Software as a service (SaaS), function as a service (Faas)

d) Hospitals and healthcare providers as non-profit/public organizations do not have the skills and resources to finance, develop and run such projects. **Can you propose a way to accelerate and complete this solution so expected services are delivered to the public at the right time?**
As we lack resources and skills to finance such a project, we'd need 3rd party investors to invest into our solution to accelerate and complete development. We can't develop a product on such a scale from nothing, so financial investment is a must. And partnering with other tech companies is a doable strategy, have them develop wearable medical devices and market them with the help of hospitals. For example make a watch with heart rate sensors and when they go to the hospital next time they'll get a personalized healthcare experience.

e) **Refer to 1e), which SDGs your digital transformation solution will positively impact and how?**
My solution positively impacts good health and well-being and promotes well-being for all at all ages. By using big data with wearable medical devices, everyone gets a personalized medical experience.

4)

Industrial digital transformation can be defined as the minimum effort to stay in business.

a) **In the commercial sector, industrial digital transformation is driven by two kinds of strategies: defensive and offensive strategies. Define and compare between the two strategies with examples?**
An offensive strategy is businesses looking to capitalize on todays' top technological trends, such as artificial intelligence, machine learning and blockchain. They will use this technology to improve their customer experiences and digital experience. It may seem like businesses are taking a leap of faith by rapidly implementing new technologies without thoroughly testing. a defensive strategy makes businesses take longer to implement new technological trends, and rely on a "why change what works" approach. This will make the company more stable, but leaves the risk of being outdone by competitors which is more daring in their approach.
Sometimes the trends shift dramatically and quickly, and organizations must stake everything on an offensive strategy, like Uber disrupting the taxi industry or Netflix overtaking blockbusters. But mostly companies just need to keep up with the pace of technological change and remain secure.

b) **Crisis has always helped industries to identify an opportunity for transformation. A new survey finds that responses to COVID-19 have speeded up the adoption of digital technologies by several years ahead. Explain that with examples?**
A lot of people have found an increase in internet usage under covid, and with a need for social distancing, a few companies have capitalized on this. Namly videoconferencing and entertainment streaming services like Zoom, Teams, Netflix, Amazon Prime video. With people working from home, Zoom found themselves a market opportunity and have now found a spot in companies digital adaptation. As companies need to communicate over the internet, it has built a solid foundation for further digital transformation.

c) **Define technical debt?**
Technical debt is a metaphor used to explain the buildup of deficiencies in a digital solution. The extra effort required to add new features due to these solution deficiencies is similar to the interest you pay on financial debt. And as these deficiencies continue to accumulate, it will be harder to implement these solutions and will impact the team and organization.

d) **What are some of the leading indicators of failure in an industrial digital transformation?**

Some leading indicators of failure in an industrial digital transformation would be a disgruntled worker force because management has forced a technological shift in the work environment without considering or laying the foundation for a cultural shift. Causes of such a focus are due to misaligned vision, economic and technological factors. There is a heavy need for a top-down approach during a digital shift where managers identify the big picture and its components and where adaptation can be implemented by the rest of the team. When implementing digital transformation, then communications through the hierarchy is key. The big boss can't just throw a software at his company and expect it to improve their supply chain. An example of poorly done transformation is Haribo, where in 2018 they tried to implement SAP. Because of this, they couldn't track their inventory, get raw material or even ship products to their stores.

e) **What is lights-out manufacturing? How is industrial digital transformation driving lights-out manufacturing?**

lights-out manufacturing is fully automated and requires no human presence on-site. And this is where the name comes from, these factories are considered able to run "with the lights off". Industrial digital transformations are driving lights-out manufacturing by using robotics and machine learning. While robots have high upfront costs, they are less expensive than human labor over time. Unlike human workers, robustly built robotics systems can run 24/7 without the need for breaks, vacations or shift changes.