### Part 1: Questions for Module 1 (Introduction to Software Design and software development process models)

Question 1: Explain the difference between incremental development and waterfall model, mainly explaining the advantages of incremental developement?

In the **incremental model**, the product is designed, implemented and tested incrementally (a little more is added in each iteration) until the product is finished while in the **waterfall model,** the project is broken down in phases which are completed sequentially.

**Advantages of Incremental approach**

1. After each iteration, testing can be conducted to identify faulty elements in the software. The cause of the errors can be easily found and reverted unlike in the waterfall approach where the whole software is built in one phase.
2. Easier to test and debug since little changes are made during each iteration.
3. Dynamic to changes: Customer can respond to features and review the product for any needed or useful changes.
4. Initial product delivery is faster and costs less.

Question 2: Giving reasons for your answer based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems:

* **A system to control anti-lock braking in a car**: Waterfall**:** This is because the anti-lock braking is just one module of the whole system of the car and can be created from top to bottom at once and then tested with the car.
* **A virtual reality system to support software maintenance**: Incremental: The VR system has many working components within itself and has to be integrated to work like a full IDE which has many smaller modules within itself.
* **A university accounting system that replaces an existing system:** Incremental: Since there was a whole system already working, it can be developed module by module so that it works more efficiently and better than the existing system.
* **An interactive travel planning system that helps users plan journeys with the lowest environmental impact:** Incremental: I would say incremental to develop this system module by module and then comparing each module with its own requirements before integrating them like Environmental data research, then impacts and then software to process the data and provide it to the users.

### Part 2: Questions for Module 2 (Need and role of Software Architecture & Architect)

Question 1: How are requirements, architecture, design and implementation related with context of software development?

Requirements are used to establish the modules/features that the software will be providing to users. Depending on the bulkiness of the requirements and each individual module, an architectural system that best suits the software should be designed and implemented such that it is cost and time saving.

Question 2: Do you believe that a separate profession of ‘software architect’ is a need of the software industry as on today? What would be his/her role? If done, what may be the difficulties of for such a professional?

Depending on the size of the project that is being worked on. For example, if it is a large project that has many modules in it that work together, I think a software architect would be required to coordinate the development and implementation process such that the modules can integrate successfully.

Also, in case the software is predicted to see many major changes in the future, a software architect would be able to overlook the redesigning and ensure that the requirements are being fulfilled.

For a smaller project however, the role of the project manager would be able to overlook all duties of the software architect if there are not many modules involved. The project manager would be able to collect information from the individual teams and assess them to decide which approaches and methods to use during the implantation.