SE – Overview of IT Industry

1. What is software? What is software engineering?  
**Software:** Software is a collection of instructions, data, or programs used to operate computers and execute specific tasks.  
Software can be system software (like operating systems), application software (like word processors), or middleware (software that connects different systems or applications).  
  
**Software Engineering:** Software engineering is the systematic application of engineering approaches to the development of software.  
Software engineering covers various methodologies, tools, and techniques used in software development, such as requirements analysis, design, coding, testing, and maintenance.

2. Explain types of software  
System Software: This includes operating systems, device drivers, and utility programs that help manage and run computer hardware and application software. Examples: Windows, Linux, macOS.

Application Software: These are programs designed for end-users to perform specific tasks. Examples: Microsoft Office, Adobe Photoshop, web browsers, and mobile apps.

Middleware: Software that connects different applications, systems, or services, enabling them to communicate and work together. Examples: databases, web servers, and message brokers.

Development Software: Tools and environments used by developers to create, debug, and maintain other software and applications. Examples: IDEs like Visual Studio, Eclipse, and compilers.

Embedded Software: Software designed to operate hardware or devices that are not traditional computers, like IoT devices, appliances, and industrial machines. Examples: firmware in a smart thermostat, software in a car's navigation system.

3. What is SDLC? Explain each phase of SDLC  
SDLC (Software Development Life Cycle) is a process used by software industry to design, develop, and test high-quality software. The SDLC aims to produce high-quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates.  
  
The phases of the SDLC are:

-Requirement Analysis: Gathering requirements from stakeholders and analysing them for feasibility. This phase results in a detailed understanding of the system's requirements.

-System Design: Translating the gathered requirements into a blueprint for constructing the software. This phase involves designing the architecture, user interfaces, and data models.

-Implementation (Coding): The actual development of the software, where programmers write code based on the design documents.

-Testing: The process of verifying that the software works as intended. This involves various types of testing such as unit testing, integration testing, system testing, and acceptance testing.

-Deployment: Installing the software in a production environment where it will be used by the end users.

-Maintenance: Ongoing support for the software after it is deployed, including bug fixes, updates, and enhancements.

4. What is DFD? Create a DFD diagram on Flipkart  
-DFD (Data Flow Diagram): A graphical representation of the flow of data through an information system, modelling its process aspects. DFDs show how data enters the system, gets processed, and leaves the system.

To create a DFD for Flipkart, I'll describe the process and key components:

Context Diagram (Level 0 DFD):

Entities: Users, Payment Gateway, Warehouse, Vendor

Processes: User Browsing, Order Placement, Payment Processing, Order Fulfilment, Inventory Update

Data Stores: Product Database, Order Database, User Database

Level 1 DFD (for Order Placement):

**Processes:**

* User selects product
* User adds to cart
* User enters shipping details
* System calculates total cost
* User makes payment

For a detailed diagram, visual tools like Microsoft Visio or online tools like Lucid chart can be used.

5. What is Flow chart? Create a flowchart to make addition of two numbers  
-**Flowchart**: A graphical representation of a process or algorithm. Flowcharts use various symbols like arrows, rectangles, diamonds, and ovals to represent the steps and decisions in a process.  
  
**Start -> Input Number1 -> Input Number2 -> Sum = Number1 + Number2 - >Display Sum ->End**

6. What is Use case Diagram? Create a use-case on bill payment on Paytm.  
  
Use Case Diagram: A type of diagram defined by UML (Unified Modelling Language) that represents the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases.

For a bill payment on Paytm:

**Actors:**

* User
* Paytm System
* Bank

**Use Cases:**

* Login
* Select Bill Payment
* Enter Bill Details
* Confirm Payment
* Process Payment
* Generate Receipt

For a detailed diagram, UML tools like StarUML, Lucidchart, or draw.io can be used to create the use case diagram.