Differentiate Active and Passive Context Awareness.

In a (pure) active context-aware system, the UbiCom system is aware of the environment context on behalf of the user, automatically adjustingthe system to the context without the user being aware of it.

This may be useful in applications where there are strict time constraints and the user would not otherwise be able to adapt to the context quickly enough.
An example of this is a collision avoidance system built into a vehicle to automatically brake when it detects an obstacle in front of it.

In contrast, in a (pure) passive context-aware system, the UbiCom system is aware of the environment context on behalf of the user. It just reports the current context to the user without any adaptation, e.g., a positioning system reports the location of a moving object on a map. A passive context-aware system can also be configured to report deviations from a pre-planned context path, e.g., deviations from a pre planned transport route to a destination. Design issues include how much control or privacy ahuman subject has over his or her context in terms of whether the subject knows: if his or her context is being acquired, where the context is being kept and to who and what the context is distributed to.

Explain Intelligence in UbiComp Systems in detail.

It is possible for UbiCom systems to be context-aware, to be autonomous and for systems to adapt their behaviour in dynamic environments in significant ways, without using any artificial intelligencein the system.]
Systems could simply use a directory service and simple event condition actionrules to identify available resources and to select from them, e.g., to discover local resources such asthe nearest printer.
• Modelling and mimicking its human environment: it is useful for a IS to have a model of a humanin order to better support iHCI. IS could enable humans to be able to delegate high-level goals tothe system rather than interact with it through specifying the low-level tasks needed to complete the goal.

• Handling incompleteness:
Systems may also be incomplete because environments are open tochange and because system components may fail. AI planning can support re-planning to present alternative plans. Part of the system may only be partially observable.
Incomplete knowledge of a system's environment can be supplemented by AI type reasoning about the model of its environment in order to deduce what it cannot see is happening.
• Handling non-deterministic behaviour: UbiCom systems can operate in open, service dynamic environments. Actions and goals of users may not be completely determined. System design may need to assume that their environment is a semi-deterministic environment (also referred to as a volatile system environment) and be designed to handle this. Intelligent systems use explicit models to handle uncertainty.

• Semantic and knowledge-based behaviour: UbiCom systems are also likely to operate in open and heterogeneous environments.

Types of intelligent systems define powerful models to support interoperability between heterogeneous systems and their components, e.g., semantic-based interaction.

Explain properties of Individual and multiple intelligent Systems

Individual Intelligent Systems

Reactive, reflex: Environment events are sensed. Events then trigger action selection that may lead to actuators changing their environments

Model-based ,Rule/policy-basedlogic/reasoning : Systems use a model of how itself operates and the how the world works , There are many types of model representation such as rule-based, different types of logic-based, etc goal-oriented, planned,proactive: User goals can be used to plan actions dynamically rather thanpre-programmed actions

Utility-based, gametheoretic: Systems can be designed to handle multiple concurrent goals Learning, adaptive: Systems can be designed to improve their own performance

Multiple Intelligent System

Cooperative collaborative,benevolent: Multiple agents can share tasks and information in order to achieve shared Goals

Competitive, self-interested,antagonistic,adversarial: Individual agents and organizations have private goals and utility functions that they seek to achieve in a multi-entity setting without requiring collaborationEntities could also act malevolently

Orchestrated,choreographed,mediated: Multiple interactions can: be controlled and ordered by designating some leader (orchestrated) who acts as a central-planer; allow some freedom ofinteraction by participants (choreographed) or constrained by the use of somecommon entity or resource (mediated)

Task-sharingCommunal,shared meaning: System interaction is sharable, commonly understood within a limited or well-defined domain

Emergent: Organizations lead to levels of interaction that are not level of the individualinteractions