Q1: State whether the following statements are TRUE or FALSE. Justify your answer. (1+1)*5=10

I) A hard real-time application consists of only hard real-time tasks.

FALSE. A hard real-time application may also contain several non-real-time tasks such as logging activities, etc.

II) All hard real-time systems are safety-critical in nature.

FALSE. Not all hard real-time systems are safety-critical in nature. E.g.: computer games, etc.

III) A good algorithm for scheduling of hard real-time tasks tries to complete each task in the shortest possible time.

FALSE. A scheduling algorithm for hard real-time tasks is only concerned with completing the tasks before the deadlines. Unlike desktop Real-Time Systems: Model QnA 2010

IV) Every safety-critical real-time system contains a fail-safe state.

FALSE. Having fail-safe states in safety-critical real-time systems is meaningless because failure of a safety-critical system can lead to loss of lives, cause damage, etc. E.g.: a navigation system on-board an aircraft.

V) A good algorithm for scheduling of hard real-time tasks tries to complete each task in the shortest possible time.

FALSE. A scheduling algorithm for hard real-time tasks is only concerned with completing the tasks before the deadlines. (Unlike desktop Real-Time Systems)

2) Draw a labeled diagram of a Digital controller and explain its working. (5+5)