Q3)

a)

The name of the topology is 12-pulse rectifier. A twelve-pulse bridge consists of two six-pulse bridge circuits connected in series, with their AC connections fed from a supply transformer with two secondary windings and one delta-connected primary winding. One secondary winding is connected in star and the other in delta. Star connected secondary feeds the upper 3-phase diode bridge rectifier, whereas the delta-connected secondary is connected to lower 3-phase diode bridge rectifier. Because of delta-wye(star) connection in secondary windings, there is a 30° phase shift between the two bridges. This results in total 12 pulse at the load. For very high-power rectifiers the twelve-pulse bridge connection is usually used. It is mainly used in HVDC systems with series devices. By using a 12-pulse rectifier, we can achieve less harmonics and this results in lower THD.

For another version of 12-pulse rectifier instead of delta-connected primary winding,wye-connection is used in primary side.