Decoder

In this question according to truth table of decoder each output i.e D0,D1,…..,D15 is assigned a particular value. For e.g. D0 is high only if all the inputs are low. So all the inputs are negated then they are anded together and assigned to D0. Similar desired assignments are made to other outputs.

Enable is also used in this circuit to tell whether the decoder is active or not.

Encoder

In this question according to truth table of the encoder outputs are assigned the desired value.

e.g. output a[3] is 1 if d[8] or d[9] or d[10] or d[11] or d[12] or d[13] or d[14] or d[15] is 1. Meaning if any one of these inputs are 1 output a[3] will be one. So or gates are used to get desired output.

Again Enable is used to show when the circuit is active and when not.