(b) Verification is the predictive analysis to ensure that the synthesized design, when manufactured, will perform the given I/O function. (2)

Verification is done before silicon development. It is done at the time of product development for quality checking and bug fixing in design. Verification is done at the physical synthesis phase.

(c) Semiconductors are materials which have conductivity between conductors and non-conductors or insulators. Semiconductors are made from pure elements, typically silicon or germanium, or compounds such as gallium arsenide.

Q2(a) Problems of BJT:

- BJTs have low thermal stability.
- BJTs have a low switching frequency.
- They have a very complex base control and so requires skillful handling.
- They produce more noise.
- There is more power dissipation and current leakage.
- Power dissipation limits device density.
- BJTs are bulky requiring more space in the IC.

(b) There are two kinds of power dissipation in CMOS - static and dynamic. The static dissipation refers to the time when the CMOS is not in the process of switching states. The static power dissipation is very less because the current flowing through the IC is nearly zero. But, there is dynamic loss as well. It is the loss which occurs while the circuit switches from one logic state to another. Some power is used to charge the capacitors as well which is known as load capacitance. All these losses together results in power dissipation in CMOS.

In static condition the current through a CMOS is zero. However there is a small amount of static power consumption due to reverse bias leakage between diffused regions and substrate of a CMOS. The source-drain diffusion and the n-well diffusion from parasitic diodes in the CMOS between n-well and substrate. These parasitic diodes contribute to power loss as they are reverse biased.