

## Special Problem 5.1 - 1

Circle the **one** correct answer for each statement.

1. For a **npn** BJT in the **active** mode, the:
  - a) base voltage will be less than the collector voltage but greater than the emitter voltage.
  - b) collector voltage will be greater than the emitter voltage but less than the base voltage.
  - c) emitter voltage will be greater than the collector voltage but less than the base voltage.
  - d) base voltage will be less than the emitter voltage but greater than the collector voltage.
  
2. For a **pn**p BJT in **active** mode, the current through the collector-base junction:
  - a) consists mainly of free electrons flowing from anode to cathode.
  - b) consists mainly of free electrons flowing from cathode to anode.
  - c) consists mainly of holes flowing from anode to cathode.
  - d) consists mainly of holes flowing from cathode to anode.

3. The collector current for an npn BJT in **saturation** is:
- a) independent of  $V_{BE}$  and  $V_{CE}$ .
  - b) dependent on both  $V_{BE}$  and  $V_{CE}$ .
  - c) dependent only on  $V_{BE}$ .
  - d) dependent only on  $V_{CE}$ .
4. For a npn BJT in the active mode:
- a) the collector current is independent of  $V_{BE}$ .
  - b) the base current is independent of  $V_{BE}$ .
  - c) the emitter current is independent of  $V_{BE}$ .
  - d) all three transistor currents are **dependent** on  $V_{BE}$ .
5. For a pnp BJT in the **active** mode:
- a) **both** the emitter-base junction and the collector-base junction are **forward** biased.
  - b) the emitter-base junction is **reverse** biased and the collector-base junction is **forward** biased.
  - c) the emitter-base junction is **forward** biased and the collector-base junction is **reversed** biased.

d) **both** the emitter-base junction and the collector-base junction are **reversed** biased.

6. For a **nnp** BJT in the **active** mode, the **free electrons** flowing across the base-emitter junction:

a) will likely exit the transistor through the **collector** terminal.

b) will likely exit the transistor through the **base** terminal.

c) will exit the transistor through both the **base** and **collector** terminals in equal amounts.

d) will likely exit the transistor through the **emitter** terminal.