

**Special Problem 4.1-1**

1. Which one of the following statements about **MOSFETS** is **false**?

- A. The source and drain wells of a NMOS device are made of heavily doped ***n*-type** Silicon.
- B. Free electrons are the majority carrier in an **inverted layer** of a **PMOS** device.
- C. Silicon dioxide is a very poor conductor.
- D. The substrate of an NMOS device is made of ***p*-type** Silicon.

2. Which of the following statements about a MOSFET in **triode** region is **true**?

- A. A channel has been induced and it is also pinched off.
- B. A channel has not been induced but it is pinched off.
- C. A channel has been induced but it is not pinched off.
- D. A channel has not been induced, nor is it pinched off.
- E. A channel is hacked off, but has yet to mouth off.

3. Which one of the following statements about **MOSFETS** is true?
- A. When in saturation, the gate current is greater than zero.
  - B. It is a three-terminal device.
  - C. It behaves like a voltage-controlled resistor, provided that the excess gate voltage is positive and  $v_{DS}$  is small.
  - D. When in triode mode, the drain current is independent of  $v_{DS}$ .
4. Which one of the following statements about **MOSFETS** is false?
- A. Both  $v_{GS}$  and  $v_{DS}$  can affect the conductivity of the induced channel.
  - B. An inversion layer is required for current to flow from drain to source.
  - C. An electric field must be established within the channel in order for an inversion layer to be formed.
  - D. No current can flow through the channel once it is "pinched off".