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## ASSIGNMENT – 2 (UNIT II)

### *Device Modeling*

### Descriptive Questions

**1. (Long Answer)**

Explain **DC model**, **small-signal model**, and **large-signal model** of MOSFET with diagrams.

**2. (Long Answer)**

Discuss **short channel effects** (SCEs) and **subthreshold operation** in MOSFETs. Draw characteristics.

**3. (Medium / Paragraph Question)**

Explain different **noise sources in MOSFET**. Describe thermal noise, flicker noise, and shot noise.

**4. (Short Note)**

**Write a short note on Diode Models.**

**5. (Short Note)**

**Write a short note on Temperature Dependence of BJT.**

## MCQs (UNIT II)

1. MOSFET small-signal model is used for:
   a) Large variations
   b) DC analysis
   c) Small variations around operating point ✔
   d) Temperature rise
2. Subthreshold current varies:
   a) Linearly
   b) Exponentially ✔
   c) Quadratically
   d) Randomly
3. Short-channel effect is significant when channel length:
   a) Increases
   b) Decreases ✔
   c) Stays large
   d) Independent
4. Flicker noise is also called:
   a) 1/f noise ✔
   b) Thermal noise
   c) Avalanche noise
   d) Laser noise
5. Diode current in forward bias follows:
   a) Linear equation
   b) Square law
   c) Exponential law ✔
   d) No relation