Started on	Tuesday, 17 October 2017, 3:51 PM
State	Finished
Completed on	Thursday, 19 October 2017, 1:52 PM
Time taken	1 day 22 hours
Grade	**6.0** out of 10.0 (**60**%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The body is doped N-
- b. The drain and source are doped P+
- c. All of these
- d. The channel is formed by attracting electrons to the surface ✓
- e. The threshold voltage is negative

The correct answer is: The channel is formed by attracting electrons to the surface

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The capacitance of a MOSFET's gate decreases as the thickness of the gate oxide increases.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Correct

Mark 2.0 out of 2.0

If an NMOS FET with W = 67.0 µm and L = 4.3 µm is biased in triode with Vgs = 1.7 and Vds = 0V, what is the on-resistance of this MOS switch in Ohms? Use: VTN = 0.5V, k'n = 100µA/V^2

Answer: 534.87 ✓

The correct answer is: 534.8

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

The gate-to-channel voltage in a saturated NMOS FET is :

Select one:

- a. Higher at the source end of the channel ✓
- b. Impossible to determine
- c. The same everywhere in the channel
- d. None of these
- e. Higher at the drain end of the channel

The correct answer is: Higher at the source end of the channel

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

The saturation region of operation for a MOSFET is when |Vgs| > |Vt| so that the FET is turned on, and |Vds| < |Vgs| - |Vt| so that the channel is pinched off near the drain.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Thursday, 19 October 2017, 1:53 PM
State	Finished
Completed on	Thursday, 19 October 2017, 2:04 PM
Time taken	11 mins 13 secs
Grade	**3.0** out of 10.0 (**30**%)

Question 1

Correct

Mark 2.0 out of 2.0

What happens to the gate capacitance of a MOSFET biased with |Vgs| > |Vt| as the gate length decreases?

Select one:

- a. None of these
- b. The capacitance doesn't change
- c. The capacitance decreases ✓
- d. Impossible to determine
- e. The capacitance increases

The correct answer is: The capacitance decreases

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

The amount of charge stored on a MOSFET's gate capacitance is directly proportional to |Vgs| – |Vt|.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Incorrect

Mark 0.0 out of 2.0

If a MOSFET with W = 82.6 µm and L = 1.7 µm is biased in triode, what is the gate-to-drain capacitance, Cgd, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 71.1 angstroms.

Answer: 34.08 ✗

The correct answer is: 341.0

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

As |Vds| is increased above |Vgs| – |Vt| for a saturated PMOS FET :

Select one:

- a. The channel becomes "pinched-off" near the source
- b. The capacitance of the drain PN junction gets larger
- c. None of these ✓
- d. The voltage across the channel increases
- e. The depletion region around the drain gets narrower

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

For a MOSFET operating in triode, the channel is pinched off near the drain.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Thursday, 19 October 2017, 2:05 PM
State	Finished
Completed on	Thursday, 19 October 2017, 2:21 PM
Time taken	15 mins 48 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true for a PMOS FET?

Select one:

- a. The drain and source are doped P+
- b. The body is doped N-
- c. The threshold voltage is negative
- d. The channel is formed by attracting holes to the surface
- e. All of these ✓

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The “overdrive voltage” for a MOSFET is given by |Vov| = |Vds| – |Vt|.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 54.4 has |Vgs| = 2.27 and |Vds| = 0.37, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k'p = 40μA/V^2, λ = 0

Answer: 3408.6

The correct answer is: 1276.1

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

What happens to the channel resistance of a triode MOSFET as |Vgs| – |Vt| increases?

Select one:

- a. None of these
- b. The resistance decreases
- c. The resistance increases
- d. Impossible to determine
- e. The resistance doesn't change

The correct answer is: The resistance decreases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

For a MOSFET operating in saturation, the channel extends all the way from the source to the drain.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Thursday, 19 October 2017, 2:25 PM
State	Finished
Completed on	Friday, 20 October 2017, 7:14 PM
Time taken	1 day 4 hours
Grade	**5.0** out of 10.0 (**50**%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The threshold voltage is positive ✓
- b. The drain and source are doped P+
- c. The channel is formed by attracting holes to the surface
- d. The body is doped N-
- e. None of these

The correct answer is: The threshold voltage is positive

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

The capacitance of a MOSFET's gate decreases as the thickness of the gate oxide decreases.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Correct

Mark 2.0 out of 2.0

What W/L ratio is needed for an NMOS FET biased in triode with Vgs = 0.7 and Vds = 0V to have an on-resistance of 151.4 Ohms? Use: VTN = 0.5V, k'n = 100μA/V^2

Answer: 330.25 ✓

The correct answer is: 330.3

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

If a PMOS FET is biased with |Vgs| > |Vt| and |Vds| > |Vgs| – |Vt|, the device is in :

Select one:

- a. Cutoff
- b. Sub-threshold
- c. Triode
- d. Saturation ✓
- e. None of these

The correct answer is: Saturation

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

The Id versus Vds curve for a MOSFET is linear for small values of |Vds| << |Vds-sat|.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 7:14 PM
State	Finished
Completed on	Friday, 20 October 2017, 7:27 PM
Time taken	12 mins 14 secs
Grade	**7.0** out of 10.0 (**70**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for a PMOS FET?

Select one:

- a. The threshold voltage is negative ✓
- b. All of these
- c. The drain and source are doped N+
- d. The body is doped P-
- e. The channel is formed by attracting electrons to the surface

The correct answer is: The threshold voltage is negative

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The flow of current between the drain and source of a MOSFET is controlled using electric fields.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 35.0 has Vgs = 1.13 and Vds = 0.24, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0

Answer: 694.575 ✗

The correct answer is: 428.4

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 1.0 out of 2.0

What happens to the gate-to-channel voltage in a saturated NMOS FET as you move from source to drain?

Select one:

- a. The gate-to-channel voltage doesn't change
- b. The gate-to-channel voltage decreases ✓
- c. The gate-to-channel voltage increases
- d. None of these
- e. Impossible to determine

The correct answer is: The gate-to-channel voltage decreases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

Most things in nature don’t just turn off abruptly like a light switch.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 7:29 PM
State	Finished
Completed on	Friday, 20 October 2017, 7:44 PM
Time taken	15 mins 37 secs
Grade	**6.0** out of 10.0 (**60**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The channel is formed by attracting holes to the surface
- b. The body is doped N-
- c. The drain and source are doped P+
- d. None of these ✓
- e. The threshold voltage is negative

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The capacitance of a MOSFET's gate increases as the thickness of the gate oxide decreases.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 70.0 has Vgs = 0.98 and Vds = 1.26, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0.52

Answer: ✗

The correct answer is: 1334.8

Question 4

Correct

Mark 2.0 out of 2.0

As |Vds| is increased above |Vgs| – |Vt| for a saturated PMOS FET :

Select one:

- a. The capacitance of the drain PN junction gets larger
- b. All of these
- c. The channel becomes "pinched-off" near the source
- d. The depletion region around the drain gets narrower
- e. The voltage across the channel stays the same ✓

The correct answer is: The voltage across the channel stays the same

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

The resistance of a MOSFET operating in triode decreases as the W/L of the MOSFET increases.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 7:45 PM
State	Finished
Completed on	Friday, 20 October 2017, 7:55 PM
Time taken	9 mins 46 secs
Grade	**7.0** out of 10.0 (**70**%)

Question 1

Correct

Mark 1.0 out of 2.0

What happens to the gate capacitance of a MOSFET biased with |Vgs| > |Vt| as the gate oxide thickness increases?

Select one:

- a. The capacitance decreases ✓
- b. The capacitance doesn't change
- c. None of these
- d. Impossible to determine
- e. The capacitance increases

The correct answer is: The capacitance decreases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

When |Vgs| > |Vt| for a PMOS FET the silicon surface directly beneath the gate oxide changes from n-type to p-type as holes are attracted to the surface.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

If a MOSFET with W = 24.9 µm and L = 0.5 µm is biased in triode, what is the gate-to-source capacitance, Cgs, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 22.8 angstroms.

Answer: 2.417 ✗

The correct answer is: 94.3

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

If an NMOS FET is biased with Vgs > Vt and Vds > Vgs – Vt, the device is in :

Select one:

- a. Triode
- b. Cutoff
- c. Sub-threshold
- d. None of these
- e. Saturation ✓

The correct answer is: Saturation

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

For a MOSFET in triode, the amount of charge in the channel at the drain end is approximately zero.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 8:42 PM
State	Finished
Completed on	Friday, 20 October 2017, 8:47 PM
Time taken	4 mins 50 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The channel is formed by attracting holes to the surface
- b. All of these
- c. The drain and source are doped P+
- d. The threshold voltage is negative
- e. The body is doped P- ✓

The correct answer is: The body is doped P-

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

Key parameters which circuit designers use to control how a MOSFET operates is the width and length of the source.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If an PMOS FET with W = 28.9 µm and L = 0.7 µm is biased in triode with |Vgs| = 1.3 and Vds = 0V, what is the on-resistance of this MOS switch in Ohms? Use: VTP = -0.5V, k'p = 40µA/V^2

Answer: ✗

The correct answer is: 756.9

Question 4

Correct

Mark 2.0 out of 2.0

As |Vds| is increased above |Vgs| – |Vt| for a saturated PMOS FET :

Select one:

- a. The capacitance of the drain PN junction gets larger
- b. The depletion region around the drain gets wider ✓
- c. None of these
- d. The channel becomes "pinched-off" near the source
- e. The voltage across the channel increases

The correct answer is: The depletion region around the drain gets wider

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

For a MOSFET operating in saturation, the channel is pinched off near the drain.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 8:47 PM
State	Finished
Completed on	Friday, 20 October 2017, 8:54 PM
Time taken	6 mins 55 secs
Grade	**6.0** out of 10.0 (**60**%)

Question 1

Correct

Mark 2.0 out of 2.0

What happens to the amount of charge on the gate of a MOSFET biased with |Vgs| > |Vt| as the |Vgs| decreases?

Select one:

- a. The amount of charge increases
- b. None of these
- c. The amount of charge doesn't change
- d. Impossible to determine
- e. The amount of charge decreases ✓

The correct answer is: The amount of charge decreases

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

The device transconductance for a MOSFET, β , is directly proportional to the gate oxide capacitance, the carrier mobility, and the W/L of the FET.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 97.8 has Vgs = 0.95 and Vds = 1.47, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0

Answer: ✗

The correct answer is: 990.2

Question 4

Correct

Mark 2.0 out of 2.0

As |Vds| is increased above |Vgs| – |Vt| for a saturated PMOS FET :

Select one:

- a. The capacitance of the drain PN junction gets larger
- b. The depletion region around the drain gets narrower
- c. The channel becomes "pinched-off" near the drain ✓
- d. All of these
- e. The voltage across the channel increases

The correct answer is: The channel becomes "pinched-off" near the drain

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

The resistance of a MOSFET operating in triode increases as the W/L of the MOSFET increases.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 8:55 PM
State	Finished
Completed on	Friday, 20 October 2017, 8:58 PM
Time taken	2 mins 52 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 1.0 out of 2.0

To keep the parasitic PN junctions in a CMOS process turned off, which of the following must be done?

Select one:

- a. The sources of the PMOS FETs must be connected to the highest voltage used on the integrated circuit
- b. The P-substrate must be connected to the lowest voltage used on the integrated circuit ✓
- c. The sources of the NMOS FETs must be connected to the lowest voltage used on the integrated circuit
- d. The N-wells must be connected to the lowest voltage used on the integrated circuit
- e. None of these

The correct answer is: The P-substrate must be connected to the lowest voltage used on the integrated circuit

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

NMOS FETs use N+ doped source and drain diffusions in a N-type substrate.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a MOSFET with W = 36.8 µm and L = 0.8 µm is biased in saturation, what is the gate-to-source capacitance, Cgs, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 83.5 angstroms.

Answer: ✗

The correct answer is: 81.2

Question 4

Correct

Mark 1.0 out of 2.0

As Vds is increased above Vgs – Vt for a saturated NMOS FET :

Select one:

- a. The voltage across the channel increases
- b. The depletion region around the drain gets narrower
- c. The channel becomes “pinched-off” near the drain ✓
- d. None of these
- e. The capacitance of the drain PN junction gets larger

The correct answer is: The channel becomes “pinched-off” near the drain

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The Id versus Vds curve for a MOSFET in saturation is nearly flat.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:02 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:03 PM
Time taken	1 min 19 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 1.0 out of 2.0

Compared to the mobility of holes in silicon, the mobility of electrons is :

Select one:

- a. Impossible to determine
- b. Larger ✓
- c. Smaller
- d. None of these
- e. The same

The correct answer is: Larger

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

When FETs are built, parasitic PN junction diodes are also created that must be kept forward biased at all times.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 3.8 has |Vgs| = 0.84 and |Vds| = 2.02, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k'p = 40μA/V^2, λ = 0

Answer: ✗

The correct answer is: 8.8

Question 4

Correct

Mark 1.0 out of 2.0

If an NMOS FET is biased with Vgs slightly < Vt and Vds > Vgs – Vt, the device is in :

Select one:

- a. Cutoff
- b. None of these
- c. Saturation
- d. Triode
- e. Sub-threshold ✓

The correct answer is: Sub-threshold

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

For a MOSFET in saturation, the amount of charge in the channel at the drain end is approximately zero.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 8:58 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:02 PM
Time taken	3 mins 25 secs
Grade	**5.0** out of 10.0 (**50**%)

Question 1

Correct

Mark 1.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The channel is formed by attracting electrons to the surface
- b. The body is doped P-
- c. The threshold voltage is positive
- d. The drain and source are doped N+
- e. All of these ✓

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

The flow of current between the drain and source of a MOSFET is controlled by varying the gate current.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 41.3 has |Vgs| = 0.80 and |Vds| = 2.36, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k'p = 40μA/V^2, λ = 0.37

Answer: ✗

The correct answer is: 139.3

Question 4

Correct

Mark 2.0 out of 2.0

As |Vds| is increased above |Vgs| – |Vt| for a saturated PMOS FET :

Select one:

- a. The voltage across the channel stays the same
- b. The depletion region around the drain gets wider
- c. The channel becomes "pinched-off" near the drain
- d. All of these ✓
- e. The capacitance of the drain PN junction gets smaller

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

A MOSFET operating in subthreshold still conducts a small amount of drain current even though |Vgs| is less than |Vt|.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:04 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:16 PM
Time taken	11 mins 48 secs
Grade	**8.0** out of 10.0 (**80**%)

Question 1

Correct

Mark 0.0 out of 2.0

Compared to the device transconductance for an NMOS FET, the device transconductance for a PMOS FET is :

Select one:

- a. Larger
- b. Smaller
- c. Impossible to determine ✓
- d. None of these
- e. Same

The correct answer is: Impossible to determine

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The threshold voltage for an NMOS FET is positive.

Select one:

- (•) True ✓
- ( ) False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Correct

Mark 2.0 out of 2.0

If an PMOS FET with W = 64.3 µm and L = 1.4 µm is biased in triode with |Vgs| = 1.9 and Vds = 0V, what is the on-resistance of this MOS switch in Ohms? Use: VTP = -0.5V, k'p = 40µA/V^2

Answer: 388.8 ✓

The correct answer is: 388.8

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

As Vds is increased above Vgs – Vt for a saturated NMOS FET :

Select one:

- ( ) a. The capacitance of the drain PN junction gets larger
- ( ) b. The voltage across the channel increases
- ( ) c. All of these
- ( ) d. The channel becomes "pinched-off" near the source
- (•) e. The depletion region around the drain gets wider ✓

The correct answer is: The depletion region around the drain gets wider

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

For a MOSFET with Vds > 0, the gate-to-channel voltage is higher at the drain end of the channel than at the source end.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:16 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:19 PM
Time taken	2 mins 40 secs
Grade	**5.0** out of 10.0 (**50**%)

Question 1

Correct

Mark 1.0 out of 2.0

What happens to the gate capacitance of a MOSFET biased with |Vgs| > |Vt| as the gate width increases?

Select one:

- a. Impossible to determine
- b. None of these
- c. The capacitance doesn't change
- d. The capacitance increases ✓
- e. The capacitance decreases

The correct answer is: The capacitance increases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

To keep the parasitic PN junction diodes turned off in a CMOS process, the P-substrate should be connected to the lowest supply voltage used on the IC.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 86.1 has Vgs = 0.67 and Vds = 0.84, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0.59

Answer: ✗

The correct answer is: 186.1

Question 4

Correct

Mark 0.0 out of 2.0

If a PMOS FET is biased with |Vgs| << |Vt| and |Vds| < |Vgs| – |Vt|, the device is in :

Select one:

- a. Triode
- b. None of these
- c. Cutoff ✓
- d. Sub-threshold
- e. Saturation

The correct answer is: Cutoff

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The amount of charge that is in the channel of a MOSFET at any particular point in the channel is inversely proportional to the gate-to-channel voltage at that point in the channel.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:20 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:22 PM
Time taken	2 mins 56 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 2.0 out of 2.0

What happens to the amount of charge on the gate of a MOSFET biased with |Vgs| > |Vt| as the |Vgs| increases?

Select one:

- a. The amount of charge doesn't change
- b. The amount of charge increases ✓
- c. Impossible to determine
- d. The amount of charge decreases
- e. None of these

The correct answer is: The amount of charge increases

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

To keep the parasitic PN junction diodes turned off in a CMOS process, the P-substrate should be connected to the highest supply voltage used on the IC.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a MOSFET with W = 1.1 µm and L = 1.3 µm is biased in triode, what is the gate-to-drain capacitance, Cgd, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 91.2 angstroms.

Answer: ✗

The correct answer is: 2.7

Question 4

Correct

Mark 0.0 out of 2.0

What happens to the current in a saturated MOSFET as |Vds| increases above |Vgs| – |Vt| ?

Select one:

- a. None of these
- b. Impossible to determine
- c. The current doesn't change
- d. The current decreases
- e. The current increases ✓

The correct answer is: The current increases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

For a MOSFET in saturation, changes in Vds have only a small effect on the drain current because the channel stops being pinched off at the drain end as |Vds| is increased.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 9:23 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:24 PM
Time taken	54 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 0.0 out of 2.0

Compared to the mobility of electrons in silicon, the mobility of holes is :

Select one:

- a. Smaller ✓
- b. None of these
- c. Impossible to determine
- d. Larger
- e. The same

The correct answer is: Smaller

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

Key parameters which circuit designers use to control how a MOSFET operates is the width and length of the gate.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 5.1 has |Vgs| = 0.67 and |Vds| = 2.31, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k'p = 40μA/V^2, λ = 0

Answer: ✗

The correct answer is: 2.9

Question 4

Correct

Mark 0.0 out of 2.0

The gate-to-drain voltage in a triode NMOS FET is :

Select one:

- a. All of these
- b. None of these
- c. Greater than the gate-to-source voltage
- d. Greater than the threshold voltage ✓
- e. Greater than the gate-to-channel voltage

The correct answer is: Greater than the threshold voltage

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The cutoff region of operation for a MOSFET is when |Vgs| < |Vt| so that the FET is turned off and no channel exists.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:24 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:27 PM
Time taken	3 mins 10 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 1.0 out of 2.0

To keep the parasitic PN junctions in a CMOS process turned off, which of the following must be done?

Select one:

- a. The N-wells must be connected to the lowest voltage used on the integrated circuit
- b. The sources of the PMOS FETs must be connected to the highest voltage used on the integrated circuit
- c. The P-substrate must be connected to the highest voltage used on the integrated circuit
- d. None of these ✓
- e. The sources of the NMOS FETs must be connected to the lowest voltage used on the integrated circuit

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The “overdrive voltage” for a MOSFET is given by |Vov| = |Vgs| – |Vt|.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 58.7 has |Vgs| = 2.00 and |Vds| = 0.32, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k’p = 40μA/V^2, λ = 0

Answer: ✗

The correct answer is: 1006.8

Question 4

Correct

Mark 1.0 out of 2.0

As Vds is increased above Vgs – Vt in a saturated NMOS FET, the voltage across the depletion region surrounding the drain PN junction :

Select one:

- a. Stays constant
- b. None of these
- c. Increases ✓
- d. Decreases
- e. Impossible to determine

The correct answer is: Increases

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

The drain current for a triode MOSFET increases linearly at first for small values of Vds, but then increases more slowly as Vds is increased further because the resistance of the channel near the drain end goes up as Vds is increased.

Select one:

- (•) True ✓
- ( ) False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 9:28 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:37 PM
Time taken	9 mins 40 secs
Grade	**8.0** out of 10.0 (**80**%)

Question 1

Correct

Mark 2.0 out of 2.0

What happens to the gate capacitance of a MOSFET biased with |Vgs| > |Vt| as the gate oxide thickness decreases?

Select one:

- a. None of these
- b. The capacitance decreases
- c. The capacitance doesn't change
- d. Impossible to determine
- e. The capacitance increases ✓

The correct answer is: The capacitance increases

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

NMOS FETs use N+ doped source and drain diffusions in a P-type substrate.

Select one:

- (•) True ✓
- ( ) False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Correct

Mark 2.0 out of 2.0

If an NMOS FET with W = 29.1 µm and L = 0.5 µm is biased in triode with Vgs = 0.9 and Vds = 0V, what is the on-resistance of this MOS switch in Ohms? Use: VTN = 0.5V, k'n = 100µA/V^2

Answer: 429.55 ✓

The correct answer is: 429.6

Correct

Marks for this submission: 2.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

What happens to the channel resistance of a triode MOSFET as W/L decreases?

Select one:

- ( ) a. None of these
- (•) b. The resistance increases ✓
- ( ) c. The resistance decreases
- ( ) d. Impossible to determine
- ( ) e. The resistance doesn't change

The correct answer is: The resistance increases

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 0.0 out of 2.0

The slope of the Id versus Vds curve for a MOSFET in saturation is zero.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Started on	Friday, 20 October 2017, 9:38 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:41 PM
Time taken	2 mins 48 secs
Grade	**6.0** out of 10.0 (**60**%)

Question 1

Correct

Mark 0.0 out of 2.0

What happens to the gate capacitance of a MOSFET biased with |Vgs| > |Vt| as the |Vgs| increases?

Select one:

- a. The capacitance decreases
- b. None of these
- c. The capacitance doesn't change ✓
- d. Impossible to determine
- e. The capacitance increases

The correct answer is: The capacitance doesn't change

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Correct

Mark 2.0 out of 2.0

The width of the channel in a MOSFET is the distance between the drain and the source.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 97.7 has Vgs = 1.00 and Vds = 1.24, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0

Answer: ✗

The correct answer is: 1221.2

Question 4

Correct

Mark 2.0 out of 2.0

If a PMOS FET is biased with |Vgs| slightly < |Vt| and |Vds| < |Vgs| – |Vt|, the device is in :

Select one:

- a. Saturation
- b. Sub-threshold ✓
- c. None of these
- d. Cutoff
- e. Triode

The correct answer is: Sub-threshold

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

The Id versus Vds curve for a MOSFET is linear even for large values of |Vds|, as long as |Vds| < |Vds-sat|.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 9:41 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:42 PM
Time taken	1 min 9 secs
Grade	**0.0** out of 10.0 (**0**%)

Question 1

Correct

Mark 0.0 out of 2.0

Compared to the process transconductance for a PMOS FET, the process transconductance for an NMOS FET is :

Select one:

- a. Larger ✓
- b. Impossible to determine
- c. Smaller
- d. Same
- e. None of these

The correct answer is: Larger

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Correct

Mark 0.0 out of 2.0

When Vgs > Vt for an NMOS FET the silicon surface directly beneath the gate oxide changes from n-type to p-type as holes are attracted to the surface.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

What W/L ratio is needed for an NMOS FET biased in triode with Vgs = 1.3 and Vds = 0V to have an on-resistance of 539.1 Ohms? Use: VTN = 0.5V, k'n = 100μA/V^2

Answer: ✗

The correct answer is: 23.2

Question 4

Not answered

Mark 0.0 out of 2.0

As Vds is increased above Vgs – Vt for a saturated NMOS FET :

Select one:

- a. The voltage across the channel increases
- b. The channel becomes "pinched-off" near the source
- c. The depletion region around the drain gets narrower
- d. The capacitance of the drain PN junction gets larger
- e. None of these

The correct answer is: None of these

Question 5

Not answered

Mark 0.0 out of 2.0

The resistance of a MOSFET operating in triode decreases as |Vgs| - |Vt| increases.

Select one:

- True
- False

The correct answer is 'True'.

Started on	Friday, 20 October 2017, 9:43 PM
State	Finished
Completed on	Friday, 20 October 2017, 9:58 PM
Time taken	14 mins 46 secs
Grade	**0.0** out of 10.0 (**0**%)

Question 1

Correct

Mark 0.0 out of 2.0

Compared to the device transconductance for a PMOS FET, the device transconductance for an NMOS FET is :

Select one:

- a. Smaller
- b. Impossible to determine ✓
- c. Larger
- d. Same
- e. None of these

The correct answer is: Impossible to determine

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 2

Not answered

Mark 0.0 out of 2.0

The length of the channel in a MOSFET is the distance between the drain and the source.

Select one:

- True
- False

The correct answer is 'True'.

Question 3

Not answered

Mark 0.0 out of 2.0

If a PMOS FET with W/L = 13.4 has |Vgs| = 0.84 and |Vds| = 1.34, what is the magnitude of the drain current in microamps? Use: VTP = -0.5V, k'p = 40μA/V^2, λ = 0.35

Answer:

The correct answer is: 45.5

Question 4

Not answered

Mark 0.0 out of 2.0

What happens to the channel resistance of a triode MOSFET as W/L increases?

Select one:

- a. The resistance increases
- b. Impossible to determine
- c. The resistance doesn't change
- d. The resistance decreases
- e. None of these

The correct answer is: The resistance decreases

Question 5

Not answered

Mark 0.0 out of 2.0

For a MOSFET with Vds > 0, the gate-to-channel voltage is lower at the drain end of the channel than at the source end.

Select one:

- True
- False

The correct answer is 'True'.

Started on	Friday, 20 October 2017, 9:58 PM
State	Finished
Completed on	Friday, 20 October 2017, 10:02 PM
Time taken	3 mins 24 secs
Grade	**6.0** out of 10.0 (**60**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for a PMOS FET?

Select one:

- a. None of these
- b. The body is doped N- ✓
- c. The drain and source are doped N+
- d. The threshold voltage is positive
- e. The channel is formed by attracting electrons to the surface

The correct answer is: The body is doped N-

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The capacitance of a MOSFET's gate increases as the width of the gate increases.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If a MOSFET with W = 3.9 µm and L = 1.3 µm is biased in saturation, what is the gate-to-source capacitance, Cgs, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 26.5 angstroms.

Answer: ✗

The correct answer is: 44.0

Question 4

Correct

Mark 0.0 out of 2.0

As Vds is increased above Vgs – Vt in a saturated NMOS FET, the voltage across the channel :

Select one:

- a. Impossible to determine
- b. Decreases
- c. Increases
- d. Stays constant ✓
- e. None of these

The correct answer is: Stays constant

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

The saturation region of operation for a MOSFET is when |Vgs| > |Vt| so that the FET is turned on, and |Vds| > |Vgs| - |Vt| so that the channel is pinched off near the drain.

Select one:

- (•) True ✓
- ( ) False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 10:02 PM
State	Finished
Completed on	Friday, 20 October 2017, 10:04 PM
Time taken	1 min 38 secs
Grade	**2.0** out of 10.0 (**20**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for an NMOS FET?

Select one:

- a. The threshold voltage is negative
- b. None of these
- c. The channel is formed by attracting holes to the surface
- d. The body is doped N-
- e. The drain and source are doped N+ ✓

The correct answer is: The drain and source are doped N+

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

To keep the parasitic PN junction diodes turned off in a CMOS process, the N-wells should be connected to the highest supply voltage used on the IC.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a NMOS FET with W/L = 53.8 has Vgs = 1.92 and Vds = 0.41, what is the drain current in microamps? Use: VTN = 0.5V, k'n = 100μA/V^2, λ = 0

Answer: ✗

The correct answer is: 2680.0

Question 4

Not answered

Mark 0.0 out of 2.0

As Vds is increased above Vgs – Vt for a saturated NMOS FET :

Select one:

- a. The channel becomes "pinched-off" near the source
- b. All of these
- c. The capacitance of the drain PN junction gets smaller
- d. The voltage across the channel increases
- e. The depletion region around the drain gets narrower

The correct answer is: The capacitance of the drain PN junction gets smaller

Question 5

Not answered

Mark 0.0 out of 2.0

The amount of charge that is in the channel of a MOSFET at any particular point in the channel is directly proportional to the gate-to-channel voltage at that point in the channel.

Select one:

- True
- False

The correct answer is 'True'.

Started on	Friday, 20 October 2017, 10:04 PM
State	Finished
Completed on	Friday, 20 October 2017, 10:13 PM
Time taken	9 mins 2 secs
Grade	**8.0** out of 10.0 (**80**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for a PMOS FET?

Select one:

- a. The channel is formed by attracting holes to the surface ✓
- b. None of these
- c. The threshold voltage is positive
- d. The body is doped P-
- e. The drain and source are doped N+

The correct answer is: The channel is formed by attracting holes to the surface

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The process transconductance for a MOSFET, k' , is directly proportional to the gate oxide capacitance, the carrier mobility, and the W/L of the FET.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Incorrect

Mark 0.0 out of 2.0

If a MOSFET with W = 54.3 μm and L = 0.8 μm is biased in triode, what is the gate-to-source capacitance, Cgs, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 84.1 angstroms.

Answer: 0.3 ✗

The correct answer is: 89.2

Incorrect

Marks for this submission: 0.0/2.0.

Question 4

Correct

Mark 2.0 out of 2.0

The gate-to-drain voltage in a saturated NMOS FET is :

Select one:

- a. None of these ✓
- b. Greater than the gate-to-source voltage
- c. Greater than the gate-to-channel voltage
- d. All of these
- e. Greater than the threshold voltage

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0.

Question 5

Correct

Mark 2.0 out of 2.0

The slope of the Id versus Vds curve for a MOSFET in saturation is very small.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 10:14 PM
State	Finished
Completed on	Friday, 20 October 2017, 10:16 PM
Time taken	1 min 47 secs
Grade	**4.0** out of 10.0 (**40**%)

Question 1

Correct

Mark 2.0 out of 2.0

Compared to the process transconductance for an NMOS FET, the process transconductance for a PMOS FET is :

Select one:

- a. Larger
- b. Same
- c. Impossible to determine
- d. Smaller ✓
- e. None of these

The correct answer is: Smaller

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 0.0 out of 2.0

The amount of charge stored on a MOSFET's gate capacitance is directly proportional to |Vds| – |Vt|.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 3

Not answered

Mark 0.0 out of 2.0

If a MOSFET with W = 3.1 µm and L = 1.0 µm is biased in triode, what is the gate-to-drain capacitance, Cgd, in femtofarads? Assume the gate dielectric is silicon dioxide with tox = 87.5 angstroms.

Answer: ✗

The correct answer is: 6.1

Question 4

Correct

Mark 0.0 out of 2.0

If a PMOS FET is biased with |Vgs| > |Vt| and |Vds| < |Vgs| – |Vt|, the device is in :

Select one:

- a. Triode ✓
- b. Saturation
- c. Sub-threshold
- d. Cutoff
- e. None of these

The correct answer is: Triode

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.

Question 5

Correct

Mark 2.0 out of 2.0

For |Vgs| < |Vt| the drain current for a MOSFET actually drops exponentially as |Vgs| is decreased rather than just suddenly going to zero.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Started on	Friday, 20 October 2017, 10:16 PM
State	Finished
Completed on	Friday, 20 October 2017, 10:26 PM
Time taken	9 mins 45 secs
Grade	**5.0** out of 10.0 (**50**%)

Question 1

Correct

Mark 2.0 out of 2.0

Which of the following is true for a PMOS FET?

Select one:

- a. None of these ✓
- b. The drain and source are doped N+
- c. The body is doped P-
- d. The threshold voltage is positive
- e. The channel is formed by attracting electrons to the surface

The correct answer is: None of these

Correct

Marks for this submission: 2.0/2.0.

Question 2

Correct

Mark 2.0 out of 2.0

The capacitance of a MOSFET's gate increases as the length of the gate increases.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0.

Question 3

Not answered

Mark 0.0 out of 2.0

If an NMOS FET with W = 46.7 µm and L = 3.1 µm is biased in triode with Vgs = 2.0 and Vds = 0V, what is the on-resistance of this MOS switch in Ohms? Use: VTN = 0.5V, k'n = 100µA/V^2

Answer: ✗

The correct answer is: 442.5

Question 4

Correct

Mark 1.0 out of 2.0

As Vds is increased above Vgs – Vt for a saturated NMOS FET :

Select one:

- a. The voltage across the channel stays the same
- b. All of these ✓
- c. The capacitance of the drain PN junction gets smaller
- d. The channel becomes "pinched-off" near the drain
- e. The depletion region around the drain gets wider

The correct answer is: All of these

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **1.0/2.0**.

Question 5

Correct

Mark 0.0 out of 2.0

A simple approximation for the minimum |Vds| required in order for a MOSFET to be in saturation is |Vds-sat| = |Vgs| - |Vt|.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 2.0/2.0. Accounting for previous tries, this gives **0.0/2.0**.