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Courses » Fundamentals of semiconductor devices

Announcements **Course** Ask a Question Progress FAQ

Unit 9 - MOSFET

Register for
Certification exam

Course outline

How to access
the portal

Basics of
semiconductor
physics

Equilibrium
carrier
concentration

Carrier transport

p-n junction

Applications of
p-n junctions
and details of
metal-
semiconductor
junction

Bipolar Junction
Transistor

Metal Oxide
Semiconductor
Capacitor

MOSFET

MOSFET – An
introduction

Gradual
Channel

Week 8_Assignmnet

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-03-27, 23:59 IST.**

1) Which of the following statements about semiconductor MOSFET are true? **1 point**

- Drain current of a p-channel MOSFET is constituted mainly by holes
- The drain and source can be used interchangeably i.e. MOSFET is a symmetric device
- Drain current of a n-channel MOSFET is constituted mainly by holes
- All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Drain current of a p-channel MOSFET is constituted mainly by holes

The drain and source can be used interchangeably i.e. MOSFET is a symmetric device

2) The diodes formed between the source/substrate junction and drain/substrate junction of a usual long-channel n-channel MOSFET is _____ and p-channel MOSFET is _____ respectively. **1 point**

- n+/p junction and p+/n junction
- p+/n junction and n+/p junction
- p/n junction and n+/p junction
- p+/n junction and p/n junction

No, the answer is incorrect.

Score: 0

Accepted Answers:

n+/p junction and p+/n junction

3) For an n-channel MOSFET, the conditions for saturation region of operation is _____ while the condition for linear or triode region of operation are _____ respectively. (VDS is drain-source voltage, VGS is gate-source voltage and Vth is the threshold voltage. Assume gradual channel approximation). **1 point**

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Funded by

- MOSFET
- Short Channel Effects in MOSFET
- Quiz : Week 8_Assignmnet
- Week 8_Assignment Solution

- Interaction session**

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- Text Transcripts**

- Compound Semiconductors**

- Opto-electronic devices: Solar cells and photo-detectors**

- Opto-electronic devices: Light Emitting Diodes (LED)**

- Applications of transistors and basics of microelectronic fabrication**

No, the answer is incorrect.
Score: 0
Accepted Answers:
 $V_{DS} > V_{GS} - V_{th}$, $V_{DS} < V_{GS} - V_{th}$ and $V_{th} > 0$

4) Consider two Silicon MOSFET's A and B with same dimensions and Silicon-oxide gate dielectric. MOSFET A is a p-channel MOSFET with oxide thickness of 100nm while MOSFET B is a n-channel MOSFET with oxide thickness of 50nm. Which of the following statement is true when same amount of gate voltage (which is greater than the threshold voltage) is applied to both the MOSFET's and they are operating in the saturation region? **1 point**

- MOSFET A will have a higher value of drain current
- MOSFET B will have a higher value of drain current
- Drain current levels in both the MOSFET's is same
- More information is required

No, the answer is incorrect.
Score: 0
Accepted Answers:
MOSFET B will have a higher value of drain current

5) A current source is an electrical element which supplies a constant magnitude of current to a load, irrespective of the value of a load connected across it. Assuming a resistive load, in which of the regions of operation can I use a Silicon n-channel MOSFET with a long-channel as a current source. **1 point**

- Linear region
- Non-linear region
- Saturation region
- MOSFET cannot be used as a current source

No, the answer is incorrect.
Score: 0
Accepted Answers:
Saturation region

6) In MOSFET devices the N-channel type is better than the P – Channel type in the following respects. **0 points**

- N-Channel type has better immunity
- N-Channel type is faster than P-Channel Type
- N-Channel type has lower noise level than P-Channel Type
- N-Channel type has better drive capability

No, the answer is incorrect.
Score: 0
Accepted Answers:
N-Channel type is faster than P-Channel Type

7) When drain voltage equals the pinch-off-voltage, then drain current with the increase in drain voltage **1 point**

- Decreases
- Increases
- Remains Constant
- None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Remains Constant

8) In MOSFET scaling, when we start scaling down the gate oxide thickness, it will lead to **1 point**

- Increase in S/D contact resistance
- P-N Junction breakdown
- Leakage current increase due to tunnelling
- None of the above



No, the answer is incorrect.

Score: 0

Accepted Answers:

Leakage current increase due to tunnelling

9) The drain induced barrier lowering (DIBL) occurs when the drain voltage of the short channel MOSFET increases from towards the **1 point**

- Saturation Region/ Cut-off Region
- Linear Region/Saturation Region
- Cut-off Region/Linear Region
- None of the above



No, the answer is incorrect.

Score: 0

Accepted Answers:

Linear Region/Saturation Region

10) Which among the following is one of the reliability problem related to short channel MOSFET? **1 point**

- Impact ionization due to high electric field near the drain side
- Avalanche breakdown of the source due to high electric field
- Avalanche breakdown of gate due to high electric field
- None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Impact ionization due to high electric field near the drain side

Previous Page

End

