

Data Science in Semiconductor Memory Manufacturing Quiz

Reviewed 2025



© 2022-2025 Micron Technology, Inc. All rights reserved. Information, products, and/or specifications are subject to change without notice. All information is provided on an "AS IS" basis without warranties of any kind. Statements regarding products, including statements regarding product features, availability, functionality, or compatibility, are provided for informational purposes only and do not modify the warranty, if any, applicable to any product. Drawings may not be to scale. Micron, the Micron logo, and other Micron trademarks are the property of Micron Technology, Inc. All other trademarks are the property of their respective owners.

Copyright guidelines

By using any content provided by the Micron Educator Hub, you acknowledge that Micron Technology, Inc. (“Micron”) is the sole owner of the content and agree that any use of the content provided by the Micron Educator Hub must comply with applicable laws and require strict compliance with these Guidelines:

1. Credit shall be expressly stated by you to Micron for use of the content, including any portion thereof, as follows:
 - a. “© 2022-2025 Micron Technology, Inc. All Rights Reserved. Used with permission.”
2. You may not use the content in any way or manner other than for educational purposes.
3. You may not modify the content without approval by Micron.
4. You may not use the content in a manner which disparages or is critical of Micron, its employees, or Micron’s products/services.
5. Permission to use the content may be canceled/terminated by Micron at any time upon written notice from Micron to You if You fail to comply with the terms herein.
6. You acknowledge and agree that the content is provided by Micron to You on an “as is” basis without any representations or warranties whatsoever, and that Micron shall have no liability whatsoever arising from Your use of the content. Micron shall ensure that the content does not violate any statutory provisions and that no rights of third parties are infringed by the content or its publication. Otherwise, liability of the parties shall be limited to intent and gross negligence.
7. You acknowledge and agree that the content is the copyrighted material of Micron and that the granting of permission by Micron to You as provided for herein constitutes the granting by Micron to You of a non-exclusive license to use the content strictly as provided for herein and shall in no way restrict or affect Micron’s rights in and/or to the content, including without limitation any publication or use of the content by Micron or others authorized by Micron.
8. Except for the above permission, Micron reserves all rights not expressly granted, including without limitation any and all patent and trade secret rights. Except as expressly provided herein, nothing herein will be deemed to grant, by implication, estoppel, or otherwise, a license under any of Micron’s other existing or future intellectual property rights.

How to cite sources from the Micron Educator Hub

- Micron is committed to collaborate with educators to make semiconductor memory education resources available through the Micron Educator Hub
- The content in the Micron Educator Hub has been identified by Micron as current and relevant to our company
- Please refer to the table on the right for proper citation

Use case	How to cite sources
Whole slide deck or whole document Description: User uses the whole slide deck or whole document AS IS, without any modification	No additional citation required
Full slide or full page Description: User incorporates a full slide or a full page into their own slide deck or document	“© 2022-2025 Micron Technology, Inc. All Rights Reserved. Used with permission.”
Portion of a slide or portion of a page Description: User copies a portion of a slide or a portion of a page into a new slide or page	This is not allowed

Quiz ideas

- 1) What is the primary goal of data science in memory manufacturing?
 - A. To create new memory products
 - B. To extract meaningful insights from data to improve yield, quality, cycle time, and cost
 - C. To design new semiconductor circuits
 - D. To automate the packaging and shipping of memory modules
- 2) What are the key drivers for Big Data and Artificial Intelligence in memory manufacturing?
 - A. High-speed internet and physical on-premise hard drives
 - B. Massive data collection capability, highly scalable computational power, and sophisticated machine learning algorithms
 - C. Advanced semiconductor materials
 - D. Mobile app development
- 3) What is the significance of the critical dimension in semiconductor manufacturing?
 - A. It controls the packaging method used for semiconductor devices.
 - B. It determines the number of layers in the semiconductor stack.
 - C. It regulates the type of substrate material used.
 - D. It is the specific width or space between features on a semiconductor wafer that must be controlled precisely during manufacturing
- 4) What is the role of machine learning in the context of memory manufacturing?
 - A. To transform data analysis by enabling nonparametric data analysis, breaking limitations of deterministic modeling, and removing subjective interpretation by humans
 - B. To create new memory designs
 - C. To improve the physical properties of the memory
 - D. To increase the battery life of devices using memory modules

Quiz ideas

5) What is a DRAM memory cell composed of?

- A. Two transistors
- B. Two transistors and one capacitor
- C. One transistor and one capacitor
- D. Two capacitors

6) What is the purpose of wafer map analysis in memory manufacturing?

- A. To design new semiconductor devices
- B. To visualize and analyze the distribution of fails and performance variations across a wafer
- C. To measure the electrical conductivity of individual memory cells
- D. To select the best substrate material for wafer fabrication

7) What is a difference between supervised and unsupervised learning?

- A. Supervised learning uses labeled data, while unsupervised learning uses unlabeled data
- B. Supervised learning does not require a known output for each input, while unsupervised learning does
- C. Supervised learning requires no training data, while unsupervised learning does
- D. Supervised learning is used in memory manufacturing, while unsupervised cannot be used

8) What is the importance of high yield in memory manufacturing?

- A. It reduces the cost per unit
- B. It increases the speed of memory chips
- C. It enhances the durability of memory chips
- D. It improves energy efficiency

Quiz ideas

9) How does machine learning handle data distribution in memory manufacturing?

- A. Machine learning always assumes a normal distribution for all data
- B. Machine learning always assumes an asymmetric distributions for all data
- C. Machine learning evaluates all parameters and data points equally without assuming a particular distribution
- D. Machine learning uses a fixed distribution model for all data

10) Which of the skills/knowledge below are needed to be an effective data science team member in the semiconductor manufacturing industry?

- A. Industry domain knowledge (manufacturing data, testing data, wafer maps, etc.)
- B. Data Science skills (Traditional statistics, machine learning, etc.)
- C. IT skills (Python, R, SQL, UI, etc.)
- D. All of the above

11) What type of data can be found in memory manufacturing?

- A. Critical dimensions, defect counts
- B. Equipment sensor, equipment history
- C. Probe and parametric test data results
- D. All of the above

Educator Hub

micron

© 2022-2025 Micron Technology, Inc. All rights reserved. Information, products, and/or specifications are subject to change without notice. All information is provided on an "AS IS" basis without warranties of any kind. Statements regarding products, including statements regarding product features, availability, functionality, or compatibility, are provided for informational purposes only and do not modify the warranty, if any, applicable to any product. Drawings may not be to scale. Micron, the Micron logo, and other Micron trademarks are the property of Micron Technology, Inc. All other trademarks are the property of their respective owners.