

Biogen Specific Teaching Material

Basic Principles of Process Control Systems and Automation –
Recipe-driven Operations





Questions & Answers

Basic Principles of Process Control Systems and Automation – Recipe-driven Operations

1. What is the difference between "in vitro" and "in vivo"?

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1. "in vitro" = maintained outside a living body, "in vivo" = maintained in a living body

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2. What tasks does a fully automated device perform during a process control?

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2. It monitors, measures and adjusts parameters.

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3. What do the nutritional and growth factors called "media" support?

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3. The nutritional and growth factors called "media" support cell metabolism and replication.

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4. Which new aspect of workflow leads to time and cost efficiency?

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4. partial and full automated control, and going paperless

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5. Which aspects are most vital for cells' successfully maintaining cell culture in vivo?

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5. all: air, food, water, temperature regulation, pH levels

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6. Which of these things do automated systems and devices NOT do when controlling a process?
- A) Compare received data to setpoints
 - B) Adjust data transmitted from sensors
 - C) Record information received from sensors

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6. B) Adjust data transmitted from sensors

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7. What is meant by 'cell culture' inside of a bioreactor?

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7. A cell culture (in a bioreactor) is a population of living cells maintained in vitro.

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8. What is disadvantageous with recipe-driven operations?

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8. The drawbacks are (1) the risk of system failure and (2) the surrogation of human operators

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9. Name (at least) three benefits of the Emerson's Syncade manufacturing execution system (MES)

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9. (sample answer) the system provides reliability, visibility,
highly regulated environment

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10. Which activity does an automated system NOT do when controlling a process?

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10. It does not evaluate and resolve any setbacks. (It only alerts these for operators to subsequently adjust).

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11. Name some advantages (pros) with recipe-driven operations.

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11. electronic batch records, paperless output, less manual labour, more repeatable operations, improvement of data integrity, etc.

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12. Name typical compounds elements that make up the media.

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12. H₂O, Na, pH buffers, ions, trace minerals, amino acids, carbohydrates, lipids, vitamins, hormones, fetal bovine serum (FBS), etc.

Thank you for your attention!

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