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Continuing Education Course #480
Chemical Feed System Design

1. What is the purpose of a chemical feed system?
 - a. Mix chemicals
 - b. Inject a chemical solution into a destination
 - c. Storage of chemicals
2. Which is NOT a typical component of a chemical feed system?
 - a. Unloading station
 - b. Feed pumps
 - c. Disinfection
3. Which is an OSHA standard?
 - a. 29 CFR 1910
 - b. 40 CFR 450
 - c. UBC 2022
4. Which is entitled "Uniform Fire Code"?
 - a. NFPA 400
 - b. UBC 1
 - c. NFPA 1
5. What is another name for a NFPA Fire Rating Label?
 - a. Hazard Box
 - b. MSDS
 - c. Fire Diamond
6. SDS stands for what?
 - a. Safety Data Sheet
 - b. Safety Distance Setting
 - c. Shower Down Section
7. Which is the preferred order for design steps?
 - a. Design criteria, P&ID, arrangement,
 - b. Design criteria, arrangement, PFD
 - c. Design criteria, PFD, arrangement
8. Which is NOT a design criteria?
 - a. 10% contingency
 - b. Provide 30 days of storage
 - c. Materials compatible with sodium hydroxide

9. Which is the highest design flow to be maintained by the pumping system?

- a. Big design flow
- b. Maximum design flow
- c. Peak design flow

10. Which is NOT a unit to express chemical dosage?

- a. Volumetric ppm
- b. Solids ppm
- c. Liquid weight ppm

11. Which is NOT a benefit of a day tank?

- a. Comply with regulations
- b. Prevent overfeeding
- c. Storage of noncompliant fluid

12. Which is a benefit of a duplex pump arrangement versus a triplex arrangement?

- a. Simple design
- b. Covers a greater range of flows
- c. Covers a greater range of pressures

13. What is a process flow diagram?

- a. Section view with hydraulic grade line
- b. Instrumentation diagram
- c. Schematic showing major components and piping

14. What is another name for chemical storage tanks?

- a. Bulk tanks
- b. Belly tanks
- c. Tiger tanks

15. Which is NOT a type of tank mixing system?

- a. Jet mix
- b. Stand mixer
- c. Side entry mixer

16. How does a positive displacement pump move fluid?

- a. Spinning impeller
- b. Chambers that fill and empty
- c. Pressure swings

17. What are the two main categories of positive displacement pumps?

- a. Centrifugal & Rotary
- b. Reciprocating & Vertical
- c. Reciprocating & Rotary

18. What is the most common type of chemical feed pump?

- a. Diaphragm
- b. Circumferential piston
- c. Progressive cavity

19. Which is NOT a diaphragm pump configuration?

- a. Side entry
 - b. Solenoid driven
 - c. Hydraulic
20. How does a peristaltic pump move fluid?
- a. Squeezing a flexible tube while rotating
 - b. Rotors rotating in opposite directions
 - c. Rotating gears creating chambers
21. What flows are common for a peristaltic pump?
- a. High
 - b. Medium
 - c. Low
22. Which is not a configuration for a peristaltic pump?
- a. Hose
 - b. Pipe
 - c. Tube
23. How does a gear pump move fluid?
- a. Squeezing a flexible tube while rotating
 - b. Lobed rotors rotating in opposite directions
 - c. Two rotating gears creating chambers
24. Which is NOT a method for flow control with a reciprocating pump?
- a. Stroke speed
 - b. Tube speed
 - c. Stroke length
25. What is a common turndown ratio for a metering pump?
- a. 0.5:1
 - b. 100:1
 - c. 10,000:1
26. What is the formula for flow control for a reciprocating pump?
- a. Pump Flow = Max Pump Flow * % Speed/100 * % Stroke/100
 - b. Pump Flow = Peak flow * % Speed / 2
 - c. Pump Flow = Max Pump Flow * % Speed * % Stroke / 2
27. In general, which can pull a greater lift?
- a. Centrifugal pump
 - b. Positive displacement pump
 - c. Vertical pump
28. Which should be larger: NPSHr or NPSHa?
- a. NPSHa
 - b. NPSHr
 - c. Should be equal
29. Which formula represents TDH?
- a. TDH = minor losses + major losses + static
 - b. TDH = minor losses + pipe friction + static

c. TDH = minor losses + dynamic losses + static

30. What does a pulsation dampener do?

- a. Moistens the pump head
- b. Sends pulse control signals
- c. Reduces pressure fluctuations

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