

Chemical and Process Engineering Basics with Safety & Operations.

QAPCO TEST

1- How many moles contains 6 gram of carbon?

- 6 moles
- 12 moles
- 1/2 moles
- 3 moles

Mole= Weight in gm/Mol. wt

2- Complete and balance the equations?

- $\text{C}_2\text{H}_6 + \text{O}_2 =$
- $\text{CH}_4 + \text{O}_2 =$
- $\text{NaOH} + \text{CO}_2 =$
- $\text{H}_2 + \text{S} =$
- $\text{C}_2\text{H}_6 + \text{O}_2 =$

3- Why flooding occurs in a fractionation column?

- Sudden low Pressure
- Sudden high Pressure
- High liquid load
- Velocity increase of vapors
- Velocity decrease of vapors

4- What is the Latent heat?

- Change the phase
- Change the temperature
- Melt the solids
- Freeze the liquids

5- How you define boiling point?

- When liquid pressure equals to atmospheric pressure
- When Vapor pressure equals to atmospheric pressure
- When any liquid boils
- When any liquid change his phase

6- What is the color of mandatory sign of site?

- Red
- Green
- Yellow
- Blue

7- Write the name of green house gas?

- Keton
- Portals
- **CO₂**
- H₂

8- What is the partial pressure?

- Pressure of the all gases
- **Individual gas pressure**

9- Which one is the quality policy sentence?

- Process is the main aim
- Quality of products is the target
- Specifications are not important
- **Consumer's satisfaction is our goal**

10- Why the cavitation occurs?

- **Low NPSH**
- High suction pressure
- Low discharge pressure
- High discharge pressure

11- Why surging occurs in a centrifugal compressor?

- High suction pressure
- Low discharge pressure
- **Low suction flow**
- High suction flow
- High discharge pressure

12- How we remove conductivity to make demin water?

- Remove ions
- Remove Ca, Mg
- Remove dust
- **Remove salt**

13- What is the effect of H₂S gas on human body?

- **Irritant and Toxic**
- Very pleasant
- Bleeding start
- Cough start

14- Why IBD performed in a steam drum?

- To remove the TDS
- To control the level

- Because boss says
 - **To remove the slug**
- 15- Where is the sensitive tray in the column?
- **Where hydrocarbon enters**
 - Where temp is measure
 - Where higher/ heavy hydrocarbon boils
 - Where stripping steam given
- 16- How you start the screw compressor?
- Open suction valve
 - Open discharge valve
 - **Open suction and discharge valve**
 - Close suction and discharge valve
- 17- Why weeping occurs in a distillation column?
- Sudden low Pressure
 - Sudden high Pressure
 - High liquid load
 - Velocity increase of vapors
 - **Velocity decrease of vapors**
- 18- What does catalyst in reaction?
- **Increase rate of reaction**
 - Decrease the rate of reaction
 - Does not act any part in reaction
 - Consume during reaction
- 19- Why maintain high PH in a boiler?
- **Because acid prepares in boiler**
 - To steam flow easily
 - To control TDS
 - Because boss says
- 20- Which steam is called saturated steam?
- HP
 - LP
 - MP
 - **None of above**
- 21- If you want to work on erected scaffolding what will you do?
- **Check Safety tag**

- See Height
 - Nothing
 - Check PTW
- 22- Where sieve trays use normally in column?
- **In stripping section**
 - In top section
 - In middle section
- 23- Why excess air confirmed in a fired heater?
- **To ensure complete combustion**
 - To control draft
 - To control firing
 - No reason
- 24- At what temperature C_2H_4 liquefy?
- 25- Which department checks Scaffolding?
- Safety department
 - Process department
 - **Maintenance department**
 - None of above
- 26- Which give chemical information?
- **MSDS**
 - PTW
 - DMDS
 - MEA
- 27- Which type of reaction is polymer reaction?
- **Exothermic reaction**
 - No heat release
 - Both endothermic exothermic
 - Endothermic
- 28- How we control centrifugal pump flow?
- **With discharge control valve**
 - With suction valve
 - With both discharge and suction
 - None of them
- 29- How we control PD pump flow?
- **With stroke length**
 - With variable rpm
 - Both of above

- None of above
- 30- Why we do fast purging in boiler?
- To remove water
 - **To remove slug**
 - To remove level
 - To remove dust
- 31- Why CBD is opened in continuous operation of boiler?
- To steam purity
 - To control level
 - To remove slug
 - **To remove precipitates**
- 32- How you purge out any vessel in industry?
- **With N₂**
 - With O₂
 - With air
 - With fuel gas
- 33- If you find a fire what will you do first?
- **Inform to control room**
 - Inform to unit head
 - Leave the plant
 - Try to extinguish the fire
- 34- Why boilers PH control more than 7?
- **To control corrosion**
 - To control steam easy flow
 - Because boss says
 - None of above
- 35- Liquid emission from plant?
- **COD**
 - SO₂
 - CO
 - CO₂
- 36- How we increase or decrease PD compressor Capacity?
- Recycle Valve
 - **Suction valve**
 - Discharge valve
 - RPM control

37- Why polymer became solids?

- Long chain molecule
- High molecular wt
- Fast reaction out of control
- **All of above**

38- Why reflux is used in a column?

- **To increase purity**
- To control product flow
- Because more liquid is prepared
- None of above

39- To enter a fork lifter in operation area?

- Its speed should be 40Km/hr
- Having a fire extinguisher
- **PTW required**
- Having no load

40- Partial pressure of a gas is equal?

- **Individual pressure of gas**
- Total pressure of gases
- None of above
- All of above

41 - **Loading and unloading arm of ethylene before use required?**

- Maintenance
- Pressure testing
- Cooling
- Heating

42- If a toxic gas released what will you do first?

- **Leave the Plant**
- Inform to control room
- Use BA to stop leakage
- Take no action

43- A vessel contains 1kg/cm² air, increase pressure with N₂ up to 6 kg/cm²g what will be the O₂ percentage in it?

- 5.5%
- **3.5%**
- 3%
- 2.5%

1. in adsorption column which tray is sensitive tray? Ans: top tray on which temp is controlled.
2. why CBD is carried out in boilers? Ans: for better steam quality.
3. in surging what is main cause? Ans: suction low flow.
4. what parameter is checked in waste water effluent? Ans: chemical oxygen demand (COD).
5. why demin water Ph is kept slightly basic? Ans: to avoid corrosion.
6. polymerization process is? Ans: exothermic.
7. 6 gms of carbon is equal to? Ans: 0.5 or half mole.
8. in case of fire firstly? Ans: inform CCR.
9. in case of sulphur smell firstly? Ans: use escape mask & inform CCR.
10. fork lifter entry in operating area required? Ans: valid work permit.
11. why saturated steam is used in reboilers? Ans: to reduce heat duty.
12. boiling point is? Ans: temp at which vapor press. = atm. Press.
13. what is flooding? Ans: high accumulated level in column.
14. who authorized scaffolding? Ans: safety section.
15. what is cavitation? Ans: When NPSH available < NPSH required.
16. how flow is controlled in centrifugal pump? Ans: by throttling discharge valve.
17. which action is wrong to control flow in PD compressor? Ans: by throttling discharge valve.
18. what is volumetric pump? Ans: vol.pump is PD pump.
19. why polymers are solids at ambient temp? ans: due to higher molecular weights.
20. which statement is not quality policy? Ans: maximum production.
21. which is not quality policy? Ans: tracibility of product is optional.
22. what shows chemical properties? Ans: MSDS material safety data sheet.
23. which is saturated steam? Ans: steam at saturated pressure.
24. why saturated steam used? Ans: due to latent heat.
25. how demin water conductivity checked? ANS: because it is good conductor after ion exchanging process.
26. how viscosity is checked? Ans: by allowing liquid through a calibrated dia orifice.
27. why fast purging is done boilers? Ans: to remove sludge and dirt.
28. which is green house gas? Ans: CO₂.
29. why hose pipes couplings are kept flexible? Ans: to facilitate operator.
30. what is mandatory signs color? Ans: blue.
31. what are disadvantages of sulphur dusr? Ans: irritation & toxication.
32. what latent heat does? Ans: phase change and temp is constant.
33. ethylene process is fast or slow? Ans: fast.
34. what is meaning of "correction"? ans: rework.
35. demin water Ph? Ans" 08 basic.
36. why steam turbine heating is carried out? Ans: to avoid thermal shock.
37. why O₂ is kept excess in furnace? Ans: for complete combustion.

38. in refrigeration compressor if suction pressure goes high? Ans: cooling will reduce and process temp will go high.
39. in solid handling what is for dilute phase conveying? Ans: air at 3 bar pressure.
40. why double block & bleed valves used? Ans: to isolate system.
41. how N2 leakages detected, by odour,color,smell or none of these? Ans: none of these.
42. Why any additive is used in polymers? Ans: for customer's satisfaction.
43. What affects better upon polyolefin, (oxygen, water or acetylene)? Ans: acetylene.
44. if O2 is 21% in a container under atm.pressure then what will O2 concentration if same container is more pressurized with 6 Kg/Cm2 nitrogen 3%,3.5%,6% or 21%?
Ans: I don't know exactly what is right answer.
45. some chemical equations to be written right hand side on answer sheet.
- $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
 - $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$
 - $7\text{O}_2 + 2\text{C}_2\text{H}_6 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
 - $2\text{NaOH} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$
 - $2\text{NaOH} + \text{H}_2\text{S} \rightarrow \text{Na}_2\text{S} + 2\text{H}_2\text{O}$

QAPCO TEST

1. What will be effect of flooding in a column. Answer: level increase
2. What is surging
3. CBD stands for continuous blow down
4. IBD intermittent blow down
5. COD chemical oxygen demand in waste water Answer: to check O2%
6. Green house gas is CO₂
7. What is PH of BFW : slightly basic
8. Polymerization is exothermic reaction
9. Why we do fast purging in boiler to remove sludge
10. Utility point identification is to facilitate operator
11. Fork lifter require vehicle entry permit?
12. In fractionation column sensitive tray temp is feed tray temp
13. Why we control DW conductivity
14. Viscosity is checked by orifice having calibrated dia
15. How much moles in 6 gram carbon (0.5)
16. In case of heavy fire first inform in control room
17. In case of sulfur smell use escape mask
18. What is difference between centrifugal and pd pumps

19. Polymers are solid and liquid at ambient temp
20. What is MSDS
21. Which thing not match with the quality policy maximum production
22. What is latent heat
23. Poly ethylene process is fast or slow
24. Mandatory signs are of red colour
25. Saturated steam reduce the duty on reboiler
26. Scaffolding authorization is from safety
27. What is cavitation
28. In centrifugal pump flow is control by discharge valve
29. In PD compressor we can not throttle discharge valve
30. Sulfur gas is irritative and toxic
31. SOME CHEMICAL EQUATIONS

