

The following are the most commonly asked technical questions for a process engineering interview. The reader is expected to write down all the answers for the same.

1. Please introduce yourself.
2. What is your present job profile?
3. Why do you want to switch jobs?
4. Why do you think this company (where you have applied) is better suited for your career goals?
5. What is your favorite topic in chemical engineering? Why?
6. Have you designed a process plant before?
7. How good are you with MS excel?
8. How to carry out heat exchanger sizing?
9. What do you mean by pump hydraulic power?
10. What is $NPSH_{available}$?
11. Explain control valve sizing procedure.
12. What is cavitation in control valves?
13. What are the different standards used in the process industry?
14. What are the different types of PSVs?
15. Explain Table 1 of API 520 Part 1.
16. Explain different line sizing criteria.
17. What is the L/D ratio of horizontal separator?
18. What are the different selection criteria for separators?
19. What are the different constraints for orifice sizing?
20. What do you mean by valve C_v ?
21. What is meant by Critical Pressure and Critical Temperature?
22. Why is reduced trim required in control valves?

23. What are the different line sizing criteria?
24. Explain pump sizing steps with an example.
25. Explain control valve sizing steps with an example.
26. What are the control valve flow characteristics?
27. What is temperature cross in the heat exchanger?
28. What are the different process standards used in the industry?
29. Explain pressure safety valve sizing steps with an example.
30. Why is typically TRV size D?
31. Explain orifice sizing steps with an example.
32. What is the compressor settle out pressure?
33. What do you mean by compressor surge?
34. Explain blow down criteria.
35. Explain the functioning of the cooling tower.
36. What are the different types of agitators?
37. Explain heat exchanger sizing steps with an example.
38. How is the reactor size decided?
39. Explain Heat Exchanger control and Interlock and Control Philosophy related to Fired Heater? (Toyo Engineering)
40. Explain Feedback and Cascade Control? Draw Feedback and Cascade Control Loop? (Toyo Engineering).
41. Why Line Sizing is important? How Line Sizing will be carried out? (Toyo Engineering)
42. Velocity guidelines for Liquid, Gas, Steam and vacuum applications? (Toyo Engineering)
43. What is Schedule no. in Line Size? What significance it has in line sizing? (Toyo

Engineering)

44. What factors affect pressure drop? (Toyo Engineering)
45. How to calculate Heat Duty of Heat Exchanger? (Toyo Engineering)
46. Show P&ID representation of the vessel where the control valve is controlling the level of the vessel? (Toyo Engineering)
47. What is PSV? Criteria for sizing Inlet line of PSV? (Toyo Engineering)
48. Criteria for sizing tailpipe of PSV and Flare Header? (Toyo Engineering)
49. If Backpressure is $<10\%$, which PSV shall be used? (Toyo Engineering)
50. Draw Centrifugal and Positive Displacement Head, Power, and Efficiency curves? (Toyo Engineering)
51. What is the best efficiency point of the pump? (Toyo Engineering)
52. Explain Heat Exchanger control and Interlock and Control Philosophy related to Fired Heater? (Toyo Engineering)
53. Explain in Detail Control Philosophy and Interlock Philosophy of Fired Heater? Draw entire P&ID for the same? (Toyo Engineering)
54. Explain IBR PSV? Which Code to be applied for PSV related to IBR Pressure Vessel? (Toyo Engineering)
55. What are the criteria to size PSV? (Toyo Engineering)
56. What is the Overpressure? (Toyo Engineering)
57. Why Set pressure of PSVs are kept different? (Toyo Engineering)
58. Draw P&ID of Fired Heater in detail and

- explain each Interlock and explain control philosophy in brief? (Jacobs India)
59. What role does DCS and PLC play? Which are the symbols and how to represent in P&ID? (Jacobs India)
 60. How do you calculate Heat Duty of Heat Exchanger? (Jacobs India)
 61. What is NPSH required and cavitation? (Jacobs India)
 62. How to prevent cavitation in pumps? (Jacobs India)
 63. How do you calculate NPSH? (Jacobs India)
 64. How to calculate the power of a pump? (Jacobs India)
 65. How do you calculate Line size and pressure drop? (Jacobs India)
 66. Which formula is used to calculate Pressure drop? (Jacobs India)
 67. How friction factor will affect pressure drop? (Jacobs India)
 68. What is roughness and does it change with the MOC of pipe? If roughness is more, will pipe pressure drop be more? (Jacobs India)
 69. What is PSV? What is the overpressure considered for the Fire case scenario? (Jacobs India)
 70. What are the different types of PSV? (Linde India)
 71. Blocked case or Fire case – which PSV is bigger? (Linde India)
 72. What are the different codes used in PSV? (Linde India)
 73. What is the pump shut off pressure? (Linde India)

74. What is the formula for shut off pressure? (Linde India)
75. What is depressurizing utility and the rule for depressurizing? (Linde India)
76. What are the line size criteria for PSV tailpipe & flare header? (Linde India)
77. What is the line sizing criteria for the blowdown line? (Linde India)
78. What are the line sizing criteria for pump suction & discharge line? (KBR India)
79. Discuss instrumentation and valves for area around centrifugal pump. (KBR India)
80. Discuss Hazen Williams formula? (KBR India)
81. Is PSV set pressure and pop up pressure the same? (KBR India)
82. Explain the refrigeration cycle. (KBR India)
83. What is the maximum velocity for the vapor line before and after the compressor? (KBR India)
84. What are the effects of the pump operating away from BEP?
85. What is Bernoulli's principle?
86. What is meant by the pipe schedule?
87. What is meant by the pump shut off head?
88. Explain the Froude number.
89. Write Mach number ranges for different types of flow.
90. Is control valve is an on-off valve? (LoneStar Technology)
91. What is a check valve? (LoneStar Technology)
92. What are the different types of valves? (LoneStar Technology)
93. What are the input parameters inline sizing? (LoneStar Technology)

94. How Orifice will work? (LoneStar Technology)
95. Where the pressure levels are high at the Orifice Upstream or the downstream? (LoneStar Technology)
96. What are the input parameters in pump sizing? (LoneStar Technology)
97. Why suction pressure has to be higher than the flowing liquid vapor pressure? (LoneStar Technology)
98. What is cavitation? (LoneStar Technology)
99. How can cavitation be eliminated? (LoneStar Technology)
100. How many types of flow are there in the Heat exchanger? (LoneStar Technology)
101. What is energy balance? (LoneStar Technology)
102. On what principle distillation column work? (LoneStar Technology)
103. What are the different outputs of the crude distillation? (LoneStar Technology)
104. What is chromatography? (LoneStar Technology)
105. What is PFD? (LoneStar Technology)
106. What are the differences between PFD and P&ID? (LoneStar Technology)
107. What are the instruments you can provide in the P&ID? (LoneStar Technology)
108. What is the purpose of the cause and effect matrix? (LoneStar Technology)
109. What is FEED? (LoneStar Technology)
110. What is the role of process engineer?
111. What are the various unit operations used in process industries?

112. What is the purpose of PFD?
113. List out the differences between PFD and P&ID.
114. What is the difference between Cv and Kv?
115. Define compressible flow and incompressible flow?
116. Define choked flow and non-choked flow?
117. What is Reynolds Number?
118. What are the input parameters required to size the control valve?
119. Describe pressure drop criteria in the selection of Control valve?
120. What is the objective of pressure safety valve sizing?
121. Define set pressure and accumulation.
122. What are the set pressure and Accumulation limits for pressure relief valves?
123. Differentiate between superimposed backpressure and built-up back pressure?
124. What is meant by chattering? How can it be eliminated?
125. What are the causes of chattering?
126. Write about Chattering solutions?
127. Is design pressure and MAWP same?
128. Differentiate between accumulation and blowdown?
129. Is it good to use a single PSV for two equipment/vessels? Why?
130. In which cases one selects multiple PSV?
131. What is the role of MAWP to design PSV?
132. What do you understand by the term depressuring rate?
133. What are the input parameters required to design a PSV?

134. What are the guidelines to follow in the line sizing?
135. Is the pump suction line greater than the discharge line? Why?
136. What is meant by erosion velocity?
137. What is the objective of line sizing?
138. What is Stokes law?
139. What is the friction factor?
140. What are STP conditions and NTP conditions?
141. What are the different types of pumps used in the industry?
142. Explain the necessity of the performance curves to size the pump.
143. Differentiate between pump and compressor.
144. Is total developed head and differential head the same? What the units?
145. Define specific gravity.
146. How to calculate $NPSH_{available}$?
147. Should $NPSH_{available}$ is greater than $NPSH_{required}$? Why?
148. Explain the effect of Specific Gravity to calculate Head?
149. Explain VLE?
150. What is relative volatility?
151. How many types of separators are available?
152. How to design heat exchanger design using Aspen EDR?
153. What is TEMA sheet?
154. When do we use heat exchangers in series or parallel?
155. How to increase the turbulence on the shell side and tube side?
156. What is temperature cross in the heat exchanger?

157. What is meant by LMTD?
158. What is the role of baffles in the heat exchanger?
159. What is fouling and its units?
160. How many types of baffles are available?
161. On what principle distillation column works?
162. What is Raoult's law?
163. Describe the use of the McCabe Thiele method.
164. What is the effect on the distillation column load if the reflux ratio is increased?
165. Define diffusivity.
166. What are the units of molar flux?
167. What is superficial velocity?
168. For pure liquid, what is bubble point temperature and dew point temperature?
169. What is relative volatility?
170. What is minimum boiling azeotrope and maximum boiling azeotrope?
171. What are the different types of distillation?
172. Provide differences between partial reboiler and total reboiler.
173. Provide differences between partial condenser and total condenser.
174. What is meant by Azeotrope?
175. What are the advantages of distillation?
176. What are the limitations of the distillation column?
177. Define vapor pressure and Reid vapor pressure.
178. Define Sensible heat and latent heat.
179. What is the purpose of the flare header?
180. What are flare system components?
181. Write about aspen Flare System Analyzer.
182. What is a flare stack?
183. Differentiate between BDV and PSV.

184. What are the design criteria for BDV?
185. Is it necessary to provide BDV and why?
186. To which system is the BDV downstream connected?
187. What is the purpose of an orifice plate?
188. What is the difference between flow orifice and restriction orifice?
189. What is the best location for flow orifice, upstream, or downstream of the control valve? Why?
190. On what principle Orifice works?
191. What is heat exchanger fouling? Using equations, please explain how heat exchanger fouling impacts the duty of heat exchangers.
192. Using equations, explain the impact of the viscosity of the heat transfer fluid on heat exchanger duty.
193. In a pipe, consider that there is a turbulent flow of fluid whose composition is known. If you know the diameter of the pipe, as well as the length of the pipe, can you calculate the flowrate of through the pipe, if you know the pressure at the inlet and outlet of the pipe? Explain your answer.
194. Consider a compressor that is designed for a certain gas mixture. What would happen if the gas mixture is changed?
195. In a distillation column, consider that we have a mixture of chemicals being fed. One of the components is in a small amount. As you perform a distillation column simulation, you find that the component is going in the bottoms. However, your friend, who is working in the plant which operates this column says that this

component is going to the top of the column, what would you do to modify the simulation.

196. In a distillation column, you have a mixture of benzene, toluene, and all the xylene isomers. If you want to separate benzene and toluene at the top, and xylenes at the bottom, can you estimate the temperature which would be at the top of the column and the temperature at the bottom of the column? Explain your answer.
197. In a distillation column, you are feeding a mixture of hydrocarbons with a vapor mass fraction of 0.7 and $10000 \text{ m}^3/\text{h}$ close to the bottom of the column. If the column has no reboiler, but the column bottom is fed with a small amount of live steam, can you estimate the liquid flow at the bottom of the column? You can make some assumptions about the steam rate.
198. In the distillation column above, there is a condenser at the top of the column, but no other side coolers / pump-around. The top condenser condenses all vapor, and part of the condensed vapor is used as reflux, and part is drawn as a top product. What will the top distillate rate? You can make some assumptions about the reflux rate.
199. In the case of a reactor, we find that a set of components A, B, and C react, and form components D and E. If all the reactions are very fast, what approach would you take to estimate the composition in the reactor product?
200. In a combustion reactor, a mixture of methane, ethane, and air is fed at roughly 50°C . Due to

the combustion reactions, the temperature at the outlet of the reactor will rise. How much air will be required if an equimolar mixture of methane and ethane at $1000 \text{ Nm}^3/\text{h}$ are reacted? What will be the outlet temperature? Explain your approach to solving this problem.

201. In the above example, if we decide to use enriched oxygen instead of air, what will it do, and why?
202. In a process, we are reacting a liquid hydrocarbon mixture with hydrogen gas in the gas-liquid mixed reactor. The reactor is followed by a separator, and the leftover gas is separated, compressed and recycled back, while the liquid leaves the system. Do you need a purge gas stream? Explain your answer. Do you need a makeup gas stream? How will you calculate the makeup gas flow? (Jacobs India)
203. What is the effect of flowrate on the head? (Jacobs India)
204. Draw Pump characteristics curve. (Jacobs India)
205. Explain different types of PSV? How does it work? (Jacobs India)
206. Describe the pressure drop criteria of the control valve. (Jacobs India)
207. Is PSV set pressure and design pressure the same or not? (Jacobs India)
208. How to carry out the PSV inlet line? (Jacobs India)
209. What information does the line list contain? (TechnipFMC India)
210. What information does the equipment list contain? (TechnipFMC India)

211. What does P&ID contain? (TechnipFMC India)
212. Why is PSV used? (TechnipFMC India)
213. What are the different types of PSVs? (TechnipFMC India)
214. How to control surge? (TechnipFMC India)
215. Provide $NPSH_A$ formula (Saipem India)
216. Which should be higher $NPSH_A$ or $NPSH_R$? (Saipem India)
217. What is shutoff pressure? (Saipem India)
218. Mark shutoff pressure in the graph. (Saipem India)
219. Draw P&ID for storage tank with pump at downstream and mention the instrument needed. (Saipem India)
220. List of documents required for P&ID making. (Samsung Engineering)
221. What are different safety valve sizing scenarios? (Samsung Engineering)
222. What is meant by NPSH of the pump? (Samsung Engineering)
223. What is the output of pump hydraulics study? (Samsung Engineering)
224. Describe the principle of blowdown. (Samsung Engineering)
225. Explain pressure drop criteria for line sizing. (Samsung Engineering)
226. Describe gas sweetening process. (Samsung Engineering)
227. Explain the procedure for control valve sizing. (Bechtel India)
228. Explain the effect of higher velocities in the pipeline. (Bechtel India)
229. Describe the PFD of the project you worked on. (Bechtel India)

230. Explain different line sizing criteria. (Bechtel India)
231. How one can reduce the pressure drop across the control valve? (Bechtel India)
232. What is the formula for erosional velocity? (Bechtel India)
233. What are pump curves? (Ingenero India)
234. How to carry out line sizing and pressure drop calculation. (Ingenero India)
235. Explain any process by using a block diagram. (Ingenero India)
236. Explain the distillation column control system. (Ingenero India)
237. What are the causes of Overpressure in the column? (Ingenero India)
238. What are the pump overpressure causes? (Ingenero India)
239. Explain every unit of the refinery in with its significance.
240. What are the simulation steps for distillation column sizing?
241. Explain TEMA and the significance of its parameters.
242. What is the significance of pv^2 in the heat exchanger?
243. What is better; crossflow or counter-current flow in a heat exchanger?