

Question Bank

Program: CH

Semester: Sixth

Name of course: Chemical Engineering Drawing

Course code: 22608

Unit Test 2

Chapter 6-Specification sheet and Process Flow Diagram (25 marks)

2 marks question

1. Draw symbols of a) Packed Bed Reactor b) Distillation column (Plate type)
2. Draw symbols of a) Centrifugal Pump b) Distillation column (Packed type)
3. Draw symbols of a) Centrifuge b) Globe valve
4. Draw symbols of a) Tray drier b) CSTR
5. Draw tank farm for two storage tanks
6. Draw UBD for steam.
7. Draw UBD for CTW

6 marks question

8. Absolute alcohol is obtained by carrying out the fractional distillation of 96% ethyl alcohol. The fresh feed is fed to an azeotrope column where benzene is used as azeotrope breaker. The ternary azeotrope of ethanol, benzene and water is formed as an overhead which is condensed and phase separation is achieved in decanter. From decanter benzene rich layer is recycled to azeotrope column as reflux and water rich layer is sent to a second fractionating column where water is drained as a bottom. Almost ethanol+ benzene is removed from top of second column which is recycled to top of first column. The bottom of azeotrope column gives almost pure ethanol. Draw process flow diagram of the following process.
9. Formaldehyde is produced by oxydehydrogenation of methanol. Air is heated in air preheater and methanol is vaporized in vaporizer. Then they are mixed in desired proportion and introduced into fixed bed reactor. The product gases containing, hydrogen, methanol, formaldehyde, water, oxygen and nitrogen are cooled in heat exchanger using suitable cooling medium. The exothermicity associated with the reaction is removed by passing compressed water on the shell side of fixed bed reactor and utilized for producing low pressure steam. The cooled product gases are then introduced to battery of scrubber /absorber in which formaldehyde and methanol are absorbed in water. The liquid mixture leaving the absorber containing formaldehyde, methanol and water is sent to intermediate storage tank. The crude formaldehyde solution from the intermediate storage tank is then fed to a distillation column from the top of which methanol is obtained and is recycled back to the vaporizer and formaldehyde in the form of formalin (37% formaldehyde solution) is removed as bottom product.
10. Acetone is produced by catalytic dehydrogenation of isopropyl alcohol. Isopropyl alcohol is vaporized, heated and fed to fixed bed catalytic reactor, where it undergoes catalytic

dehydrogenation to acetone. The reactor exit gases pass to condenser where most of acetone water and alcohol is condensed out. The final traces of acetone and alcohol are removed in water scrubber. The effluent from scrubber is combined with condensate from the condenser and distilled in a column to produce pure acetone and an effluent (bottom product) consists of the water and alcohol. The effluent is distilled in a second column to separate excess water. The product from second column is azeotrope of water and alcohol (11%). It is recycled to reactor. Temperature in reactor is 500°C and pressure is 50 psig.

11. Draw ULD of Q no 8
12. Draw ULD of Q no 9
13. Draw ULD of Q no 10
14. Draw Specification sheet of Heat Exchanger
15. Draw Specification sheet of Reactor
16. Draw temperature control system for reactor and heater.
17. Draw distillation column top and bottom control system.
18. Draw control system for dryer and vaporizer.

Chapter 1 -Introduction to CAD (06 marks)

2 marks question

19. Give any two applications of Computer Aided Drafting (CAD) software in chemical Industry.
20. State the any two formatting commands use in CAD
21. Give any two Grips editing commands used in CAD.
22. Names any four CAD initial setting commands.
23. Write any two object selecting methods.

Chapter 2 - CAD for Chemical Equipment Symbol (06 marks)

2 marks question

24. Write procedure for line command
25. Write procedure to move object
26. Write procedure to copy object
27. List any two formatting commands
28. List any two grips editing commands