

Scheme – G
Sample Test Paper - I

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Sixth

Subject Title : Chemical Engineering Drawing

Marks : 25

17647

Time: 1 Hour

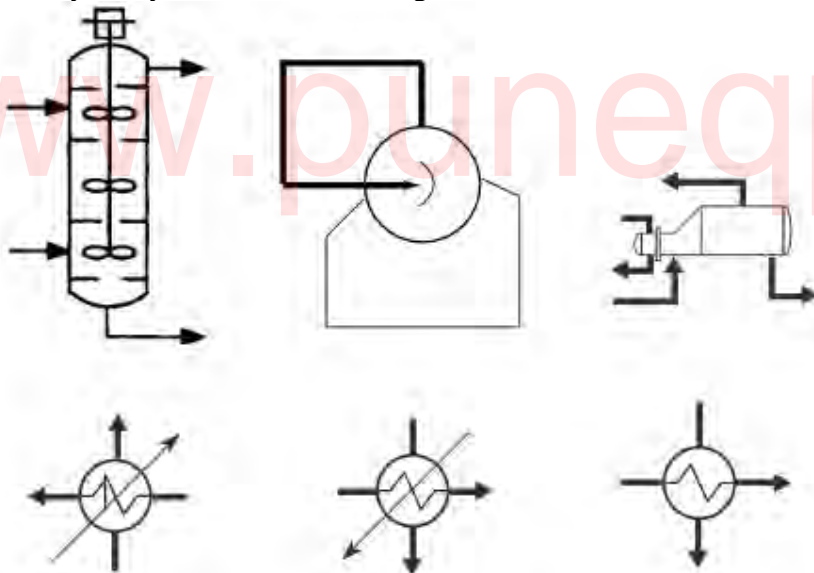
Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE

18 Marks

a) Identify the symbol shown in the figure below -



- b) Draw proportionate free hand sketch of spring loaded lever safety valve and label it.
- c) Show with proper pipe fitting how two pipes having external threading and of different diameters connected. Draw the complete view along with pipe fitting and pipes.
- d) Draw proportionate free hand sketch of skirt support for vertical vessels and label it.

Q2. Attempt any ONE

07 Marks

- a) Draw proportionate free hand sketch of socket and spigot joint.
- b) Draw proportionate free hand sketch of swing check valve for horizontal pipe line.

Scheme – G
Sample Test Paper - II

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Sixth

Subject Title : Chemical Engineering Drawing

Marks : 25

17647

Time: 1 Hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt the following

Process :

Isopropanol (IPA) is vaporized, compressed to 3 atm pressure and then preheated. It is then passed through catalytic tubular reactor maintained at 500 °C with the catalyst consisting of copper and/or brass. The hot gases from the reactor is condensed and scrubbed with water. In the scrubber IPA-Acetone mixture is separated from hydrogen gas. The binary mixture is then passed through a fractionating column in which acetone is removed from top and the binary mixture of IPA-water is then fed to another column where IPA is removed from the top and water from the bottom. The separated IPA has a purity of about 88% and is recycled to the process.

- a) Draw the Process Flow Diagram for the above process (06)
- b) Draw the Process and Instrumentation Diagram for the above process. (10)
- c) Draw the Tank Farm Diagram for the above process. (04)
- d) Draw the Utility line diagram for Steam. (04)

Scheme – G
Sample Question Paper

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Sixth

Subject Title : Chemical Engineering Drawing

Marks : 100

17647

Time: 4 Hours

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1(A). Attempt any THREE

12 Marks

- a) Draw neat proportionate symbols of Jacketed Reactor with internal coils, Tray Drier
- b) Draw instrumentation symbols of Pneumatic valve, Rotameter
- c) Draw free sketch of any 2 packings used in packed towers.
- d) Draw neat sectional views of Tee, Elbow used for small pipes.

Q1(B). Attempt any ONE

08 Marks

- a) Draw specification sheet for a Batch Reactor.
- b) Draw a neat, proportionate drawing of 1-1 Shell & Tube Heat Exchanger with internal configurations and nomenclature.

Q2. Attempt any FOUR

16 Marks

- a) Draw a neat, proportionate drawing of any 2 types of heads. Indicate dimensions on them.
- b) Draw a neat, proportionate sketches of a Welded Neck Flange and Tongue & Groove Flange.
- c) Show by neat proportionate free hand sketch any two types of steam pipe supports.
- d) Show by neat proportionate free hand sketch lever safety valve.
- e) Show by neat proportionate sectional drawing of Globe valve with nomenclature.
- f) Draw a neat, proportionate sketches of a loop joint

Q3. Attempt any FOUR

16 Marks

- a) Draw any 2 types of jackets used for pressure vessels.
- b) Draw a neat, proportionate sketches of a Hydraulic Joint.
- c) Draw a neat proportionate drawing of a Bracket support for vertical Vessels.
- d) Draw a neat proportionate sketch of saddle support.
- e) Draw a neat sketch of a Ball Valve.
- f) Draw neat sketches of a Lift Check valve and a Swing Check Valve.

Q4. Read the process and attempt the following

16 Marks

Absolute alcohol is obtained by carrying out the fractional distillation of 96% by weight ethyl alcohol. The fresh feed containing ethyl alcohol is fed to an azeotropic column where benzene is added as an entrainer. The ternary azeotrope of ethanol, benzene and water is formed as the

overhead which is condensed and phase separation is achieved in a decanter. From the decanter, the benzene rich layer is recycled to the azeotrope column (as reflux) and water rich layer is sent to the second fractionating column (a recovery column), where water is drained as bottoms. Ethanol+benzene is removed from the top of the recovery column which is recycled to the top of the azeotrope column. The bottom of the azeotrope column gives almost pure ethanol (99.5%).

Draw a neat, detailed process flow diagram with legend for the above process.

Q.5 Answer the following.

16 Marks

- a) For the process description given in Q. No 4 above, draw Utility Line Diagram.
- b) Draw the Piping & Instrumentation diagram of a continuous distillation column with reflux and reboiler.

Q6. For the process description given in Q. No 4 above, draw

16 Marks

- a) Draw the equipment layout diagram for the process given above
- b) Draw the Tank farm diagram for the process given above.

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