

Printed Pages : 3



ECH052

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 151852

Roll No.

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B.Tech

(SEM. VIII) THEORY EXAMINATION 2014-15

DESIGN OF PIPING SYSTEM

Time : 3 Hours]

[Total Marks : 100

- Note: (1) Attempt **ALL** questions.
 (2) Assume suitable data, if required.
 (3) **All** question carry equal marks.

- 1 Attempt any **FOUR** parts of the following: - **5x4**
- Why are material feeding devices essential with positive pressure pneumatic conveying system?
 - Explain the term 'Energy losses in pipe lines' with suitable examples.
 - Give the procedure for the determination of the flange stress under external pressure.
 - Write the importance of piping in process industries.
 - Give the suitable correlation for the calculation of pressure drop of the steam pipe.
 - Discuss Newtonian fluids with suitable examples.

- 2 Attempt any **FOUR** parts of the following: - **5x4**
- (a) Write a short note on 'Pipe Attachment'.
 - (b) Describe the equivalent resistances of fitting and valves.
 - (c) Describe the physical significance of Reynolds number.
 - (d) Explain 'Coupling of pipes' with suitable example.
 - (e) Discuss non-Newtonian fluids with suitable examples.
 - (f) Discuss the role of 'Schedule number' in piping design.
- 3 Attempt any **TWO** parts of the following: - **10x2**
- (a) Differentiate between Pipes & Tubes. Estimate the safe working pressure for a 10cm diameter, schedule 40 pipe, carbon steel, butt welded, working temperature 100 °C. The safe working stress for butt welded steel pipe up to 125 °C is 41.2 N/mm².
 - (b) Discuss the term 'optimum pipe diameter'. Also derive a general equation for the optimum diameter of pipe used for natural gas pipe line.
 - (c) Define vibration in piping design. How will you prevent vibrations in piping systems? Explain with suitable examples.

- 4 Attempt any **TWO** parts of the following: - **10x2**
- (a) Discuss the hazards associated with the pneumatic transport of solids with suitable examples.
 - (b) Discuss the method by which you can incorporate flexibility in to piping systems to absorb thermal expansion. Explain with suitable examples.
 - (c) Explain the procedure for the design conditions and criterion of the oil-carrying pipes, with suitable examples.
- 5 Write short notes on any **FOUR** parts of the following: - **5x4**
- (a) Coupling of pipes
 - (b) Tolerances
 - (c) Thixotropic slurries
 - (d) Valves & Fittings
 - (e) Butt Joint
 - (f) Components of pipe bends
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