

Total No. of Questions : 8]

SEAT No. :

PD4718

[Total No. of Pages : 2

[6404]-224

B.E. (Mechanical Engineering)
PROCESS EQUIPMENT DESIGN
(2019 Pattern) (Semester - VIII) (Elective-VI) (402051A)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data, if necessary.

- Q1) a)** Explain design of thick cylinders subjected to internal pressure based on maximum principal stress theory and derive the equation to find thickness of cylinder wall. **[9]**
- b)** Explain the purpose of pre-stressing of cylinders. Explain any one method in detail with neat labeled sketch. **[9]**

OR

- Q2) a)** A long thick steel tube of inner diameter 150 mm is subjected to an internal pressure of 20 N/mm². The allowable compressive and tensile stresses for the tube are 160 N/mm² and 100 N/mm² respectively. Determine the outer diameter of the using: **[10]**
- i) Maximum principal stress theory
- ii) Maximum shear stress theory
- Derive the expression you use.
- b)** Explain the design of openings in pressure vessel by area compensation method. **[8]**

- Q3) a)** Explain the three types of floating roofs used in floating roof type tank with sketches. **[9]**
- b)** Explain the pump selection procedure for pump used in process industry. **[8]**

OR

- Q4) a)** Explain shell and tube type of heat exchanger with neat labeled sketch. **[8]**
- b)** List the different types of valves used on pipe line. Explain any two types of valves with neat sketch. **[9]**

P.T.O.

- Q5) a)** List the different pressure measuring instruments and explain principal, construction and working of Bourdon tube with neat labeled sketch. [9]
- b)** Discuss with neat labeled sketch, any type of flow meter used to measure flow of highly corrosive liquids involving measurement of erosive slurries. [9]

OR

- Q6) a)** Explain functions of controller. [4]
- b)** Explain PID controller with block diagram. [6]
- c)** Describe with neat sketches, principal, construction and working of LVDT. [8]

- Q7) a)** What is purpose of using protective coating on metal? Write note on metallic coating and inorganic coating. [8]
- b)** List NDT methods used for surface defects. Discuss any two methods used for detection of surface defects. [9]

OR

- Q8) a)** What is the purpose of lining for chemical plant and equipments? Explain the different types of lining used in chemical plant. [8]
- b)** Differentiate between destructive and Non-destructive testing. Explain Radiographic testing used for detection of internal defects. [9]

