Seat No.: _____ Enrolment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA ENGINEERING – SEMESTER – V • EXAMINATION – SUMMER-2017

Subject Code: 3355502 Date: 4-05-2017

Subject Name: PROCESS PIPING FABRICATION

Time: 2.30 TO 5.00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Each question carry equal marks (14 marks)**

Q.1 (a) Define below terms. (any three) **07**

(1) Alloy steel, (2) Coupling (3) Expansion Joints (4) Ambient Temp.

(b) Describe duties and responsibility of piping field engineer. **07**

Q.2 (a) Prepare lists of following piping elements: **07**

1) Various types of pipe fittings.
2) Various types of Fasteners.
3) Various types of Valves.
4) Various types of piping specialties.

(b) Calculate area of (1) Sector, (2) Triangle, (3)Segment **07**
from the given fig.No.1, Having Circle Radius (r) = 20 mm $\theta = 90^{\circ}$

OR

(b) Answer the following questions from given Piping ISO drawing with necessary calculations: **07**

1. Write (a) Drawing No. (b) Revision No.
2. Start point co-ordinates and End (1 and 2) point co-ordinates (N, E, EL).
3.1 No. Of Site /Field Joint
3.2 No. Of Shop/Spool Joint
3.3 Total No. Of Joints
3.4 No. of reducers with size
3.5 No. Of Bends / Elbows with size.
3.6 No. of spools in given Isometrics
3.7 Calculate required pipe length with size.
4. Total Amount of :
1) Inch-Meter Erection In Piping Isometrics.

Q.3 (a) Define and Explain "Reynolds number". Compare Laminar and Turbulent flow. **07**

(b) A spherical Storage tank is having O.D = 610 cm, Thickness (t) = 5 mm. **07**
If Rate of Painting = 120 Rs. / m^2 and Cost of Raw material= 200 Rs. / Kg
Find: 1] Inside volume of storage tank.
2] Total cost of outside Painting.
3] Total cost of Raw material of tank.

OR

Q.3 (a) Calculate the diameter of pipe to carry , **07**
Q = Discharge = 300 lit / Min of water
V = Maximum velocity = 15 M / sec, Also find the loss head due to friction [Loss of pressure due to friction] in pipe if, Length of pipe = L = 15 KM
Assume
Co efficient of friction = f = 0.015, Gravitation al constant = g = 9.8 M / sec^2.

(b) Define Gasket & Classify Gasket based on various criteria. **07**
State properties, need and functions of gasket.

Q.4 (a) Define the term 'Pressure drop' (head losses) in piping? **07**
Explain the phenomena of pressure drop and state its causes.

(b) Describe with neat sketch "purging process" in pipe fabrication and full penetration pipe welding. **07**

OR

Q.4 (a) Draw piping symbol of (any seven) **07**
1) gate valve, 2) Concentric Reducer, 3) Expansion joint, 4) Elbow,
5) Tee, 6) pressure gauge, 7) Check valve, 8) Butterfly valve, 9) air vent

(b) Prepare PQR for following data:(Assume suitable additional data if necessary) **07**
1) Material : SA 516 GR 70, 2) Pipe dia : 400 mm
3) Electrode : E-7018 of ø 2.5 × 350 mm, 4) Thickness of pipe:12 mm (assume)
5) Welding process : GTAW, 6) Position : 5G/6G

Q.5 (a) Define "pipe support" and describe function of pipe support. **07**

(b) Describe with neat sketch Expansion Joint. **07**

OR

Q.5 (a) State factors affecting selection of paint and coating. **07**

(b) Compare up hill & down-hill welding with neat sketch. **07**

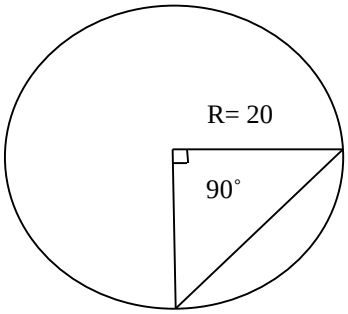
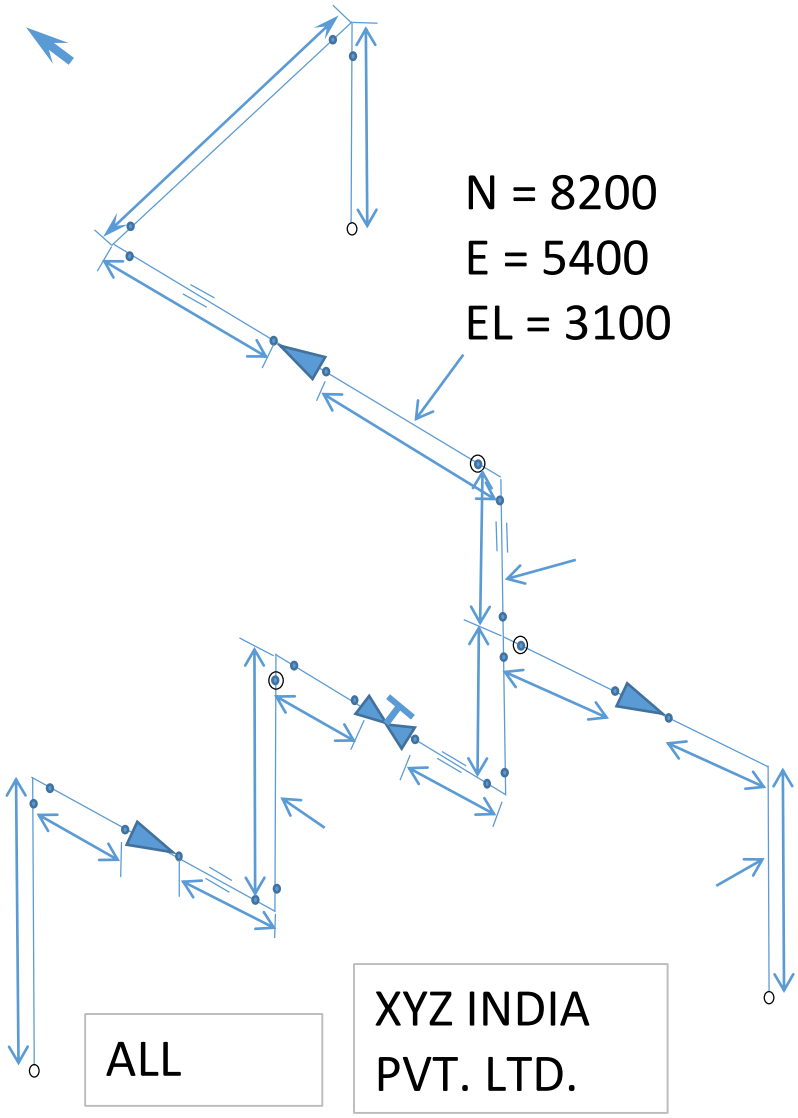


Fig No.1



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