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Courses » Upstream LNG Technology

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Unit 4 - Week 3

Course outline

[How to access the portal](#)[Week 1](#)[Week 2](#)**Week 3** Lecture 14 :
Flow in Natural Gas Systems Lecture 15 :
Flow Measurement In Natural Gas -I Lecture 16 :
Flow Measurement In Natural Gas -II Lecture 17 :
Temperature and Quality Measurement in Natural Gas Systems Lecture 18 :
Pressure measurement in natural gas systems Lecture 19 :
Tutorial on the

Week 3 : Assignment 3

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2018-09-05, 23:59 IST.** assignment.

1) The e.m.f across a copper-constantan thermocouple is evaluated using the equation **1 point**

$$\text{e.m.f} = a_1T + a_2T^2 + a_3T^3 + a_4T^4, \text{ where } T \text{ is in K and e.m.f is in mV}$$

The values of the coefficients are given in Table 1. The e.m.f, when the temperature is 350 K would be approximately,

Table 1: Values of coefficients for copper-constantan thermocouple

Coefficient	Copper-Constantan Type T
a_1	-3.87706×10^{-2}
a_2	-4.56877×10^{-5}
a_3	4.35205×10^{-8}
a_4	1.51931×10^{-11}

 a) -1.5 mV b) -9 mV

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Material

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2) Water having density of 1000 kg/m^3 and viscosity 1.0 cP , is flowing through a pipe of diameter 12 mm with a velocity of 1 m/s . The Reynolds number of the flow is approximately **1 point**

- a) 135
 b) 12000
 c) 2654
 d) 40000

No, the answer is incorrect.

Score: 0

Accepted Answers:

b) 12000

3) Reynolds number is defined as **1 point**

- a) $\frac{\text{Inertia force}}{\text{Viscous force}}$
 b) $\frac{\text{Pressure force}}{\text{Viscous force}}$
 c) $\frac{\text{Inertia force}}{\text{Gravity force}}$
 d) $\frac{\text{Pressure force}}{\text{Gravity force}}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

a) $\frac{\text{Inertia force}}{\text{Viscous force}}$

4) Compressed air (density 2 kg/m^3 , and viscosity $18.1 \times 10^{-6} \text{ kg/m.s}$) is flowing through a smooth conduit of hydraulic diameter 20 cm , with a velocity of 1.2 m/s . The friction factor computed using polyflo equation is approximately **0 points**

- a. 1.2
 b. 0.3
 c. 0.1
 d. 0.7

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. 0.3

5) Which of the following statements is NOT TRUE for platinum RTDs **1 point**

- a. They have high sensitivity
 b. They have high stability
 c. They work based on Seebeck effect
 d. They have high accuracy

No, the answer is incorrect.

Score: 0

Accepted Answers:

c. They work based on Seebeck effect

6) The average molecular mass of the natural gas is approximately

0 points

- a) 27 g/mol
- b) 19 g/mol
- c) 45 g/mol
- d) 14 g/mol

No, the answer is incorrect.

Score: 0

Accepted Answers:

b) 19 g/mol

7) The specific gravity of the gas, if the molecular mass of air is 28.97 g/mol, is approximately

0 points

- a) 0.655
- b) 0.904
- c) 0.231
- d) 1.000

No, the answer is incorrect.

Score: 0

Accepted Answers:

a) 0.655

8) Given the compressibility factor of the gas as 0.88, density of the gas at 350 K and 2 atm pressure is approximately,

0 points

- a) 2.75 kg/m^3
- b) 4.15 kg/m^3
- c) 1.5 kg/m^3
- d) 0.85 kg/m^3

No, the answer is incorrect.

Score: 0

Accepted Answers:

c) 1.5 kg/m^3

9) Given the higher heating value of the gas as 1050 Btu/ft^3 and the density of air as 1 kg/m^3 , Wobbe number of the gas is approximately,

0 points

- a. $190 \frac{\text{Btu}}{\text{ft}^3}$
- b. $509 \frac{\text{Btu}}{\text{ft}^3}$
- c. $125 \frac{\text{Btu}}{\text{ft}^3}$
-

d. $857 \frac{\text{Btu}}{\text{ft}^3}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. $857 \frac{\text{Btu}}{\text{ft}^3}$

10 For an air-fuel ratio of 10.5, the CARI of the gas is

0 points

- a) 10.5
- b) 13
- c) 15
- d) 20

No, the answer is incorrect.

Score: 0

Accepted Answers:

b) 13

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