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Unit 4 - Week 3

Week 3 : Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-05, 23:59 IST.

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

$$\text{e.m.f} = a_1 T + a_2 T^2 + a_3 T^3 + a_4 T^4, \text{ where } T \text{ is in K and e.m.f is in mV}$$

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

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) $\frac{Inertia\,force}{Viscous\,force}$

4) Compressed air (density 2 kg/m^3.s, and viscosity 18.1 x 10^{-6} 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**

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

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
$d.\ 857\ \frac{Btu}{ft^3}$

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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