

## Unit 3 - Week 2

### Course outline

How does an NPTEL online course work?

#### Week 1

#### Week 2

- Lecture 6: Introduction to Physical Modeling
- Lecture 7: Concept of Similarity in Physical Modeling
- Lecture 8: Dimensional analysis
- Lecture 9: Physical Modeling of Isothermal and Non-Isothermal system
- Lecture 10: Consideration in Aqueous Modeling
- Quiz : Assignment 2
- Solution for Assignment 2

#### Week 3

#### Week 4

#### Week 5

#### Week 6

#### Week 7

#### Week 8

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## Assignment 2

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

**Due on 2020-02-12, 23:59 IST.**

1) Usually,.....modeling is used to validate ..... modeling results.

1 point

- Mathematical and Physical  
 Physical and Mathematical  
 Both a & b  
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Physical and Mathematical

2) If the length of model tundish is 3 meter and prototype tundish is 6 meter, the value of length scale factor( $\lambda$ ) is

1 point

- 1/2  
 2  
 2/3  
 3/2

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
1/2

3) Dynamic similarity deals with

1 point

- Velocity  
 Force  
 Both force and velocity  
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Force

4) The primary reason(s) for the popularity of water models is(are)

1 point

- Easy visualization of flow  
 Cheap and ready availability of water  
 Low capital and operating cost of models  
 All of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of the above

5) The height of the prototype tundish is 6 meter and that of model tundish is 3 meter. If the width of prototype tundish is 2 meter, then width of model tundish will be

1 point

- 4 meter  
 1 meter  
 8 meter  
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
1 meter

6) One of the criteria for dynamic similarity is (Where  $m$ ,  $p$ , and  $Re$  represent model, prototype, and Reynold No. respectively)

1 point

- $Re_m = Re_p$   
  
 $Re_m > Re_p$   
  
 $Re_m < Re_p$   
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $Re_m = Re_p$

7) Tundish Richardson number is

1 point

(where  $g$ ,  $\beta$ ,  $L$ ,  $T$  and  $U$  are gravitation acceleration, volume expansion coefficient, characteristics length, temperature and characteristics velocity respectively)

- $\frac{g\beta\Delta TL}{U^2}$   
  
 $\frac{g\beta\Delta T U^2}{L}$   
  
 $\frac{g\beta\Delta T}{U^2 L}$   
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $\frac{g\beta\Delta TL}{U^2}$

8) Effective viscosity ( $\mu_{eff}$ ) is

1 point

(Where  $\mu_t$  is turbulent viscosity and  $\mu$  is molecular viscosity)

- $\frac{\mu_t}{\mu}$   
  
 $\mu_t * \mu$   
  
 $\mu_t + \mu$   
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $\mu_t + \mu$

9) Peclet number is the ratio of

1 point

- $\frac{Diffusion\ transport}{Convection\ transport}$   
  
 $\frac{Convection\ transport}{Diffusion\ transport}$   
  
 $\frac{Diffusion\ transport}{Mass\ transport}$   
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $\frac{Convection\ transport}{Diffusion\ transport}$

10) In Buckingham pi theorem, if  $F$  represents the total number of primary quantities such as length, mass, temperature, time, etc. and  $E$  represents the total number of independent and dependent variables governing the process, then number of dimensionless equations are equal to

1 point

- E+F  
 E-F  
 E\*F  
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
E-F