

Unit 7 - Week 6

Course outline

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Week 6

Operational Energy: Thermal Conductivity Models (Contd..)

Operational Energy: Estimation of Thermal Conductivity

Thermal Diffusivity and Clay Bricks

Types of Bricks Kilns and Carbon Balance

PDF File

Quiz : Assignment 6

Feedback Form

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Solution of Assignment

Assignment 6

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

Due on 2019-09-11, 23:59 IST.

1) Which of the following factors affect the thermal conductivity of concrete

1 point

- Aggregate type
 Porosity
 Moisture content
 All the above

No, the answer is incorrect. Score: 0

Accepted Answers: All the above

2) Choose the correct option that places various brick kilns in the descending order of their specific energy consumptions (SEC)

1 point

* DDK = Down-Draught Kiln, FCBTK = Fixed Chimney Bull's Trench Kiln

- FCBTK, Tunnel-Vietnam, Zig-Zag Kiln, DDK
 Tunnel-Vietnam, Zig-Zag Kiln, DDK, FCBTK
 DDK, Tunnel-Vietnam, FCBTK, Zig-Zag Kiln
 Zig-Zag Kiln, DDK, FCBTK, Tunnel-Vietnam

No, the answer is incorrect. Score: 0

Accepted Answers: DDK, Tunnel-Vietnam, FCBTK, Zig-Zag Kiln

3) Match the following stages of firing bricks with temperature ranges

1 point

	Temperature range		Prevalent processes
A	$T < 200^{\circ}C$	1	Evaporation of chemically combined water
B	$400^{\circ} < T < 600^{\circ}C$	2	Decomposition of calcium carbonate impurity
C	$600^{\circ}C < T < 800^{\circ}C$	3	Removal of mechanical moisture

- A-1, B-2, C-3
 A-3, B-1, C-2
 A-3, B-2, C-1
 A-1, B-3, C-2

No, the answer is incorrect. Score: 0

Accepted Answers: A-3, B-1, C-2

State True/ false

4) Strength increases with increase in firing temperature.

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: String) True

1 point

5) Water absorption increases with increase in firing temperature.

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: String) False

1 point

6) The process of vitrification is usually.....

- endothermic
 exothermic

No, the answer is incorrect. Score: 0

Accepted Answers: exothermic

1 point

7) Thermal conductivity of brick at dry and saturated states are 0.5 W/m/K and 1.6 W/m/K respectively, the maximum value of thermal conductivity occurs at degree of saturation equals to 1. What is the thermal conductivity at 50% saturation ? [Hint: Assume quadratic variation for thermal conductivity with degree of saturation]

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 1.300,1.350

3 points

Questions (8-10) are linked

The fuel burning rate of a Down-Draught Kiln (DDK) is 3000 kg/h. Stack sampling data collected from the chimney of the kiln is used to estimate the particulate matter emissions. Emission rate of the brick kiln is found to be 3.50 kg/h, when the volumetric flow rate of stack gas is 12 m³/s. Burning 1kg of firewood yields 50kJ of energy input to the kiln. Based on the given information, answer the following questions.

8) Determine the concentration of particulate matter in the stack gas (in mg/m³ of air)

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 80,82

2 points

9) Determine emission factor of the kiln on mass basis (in g/kg of fuel).

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 1.150,1.190

2 points

10) Determine emission factor of the kiln on energy basis (in g/MJ)

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 22.5,24.5

2 points