

2012-13 Kurtsoa. Maiatzeko azterketa. **Curso 2012-13. Examen mayo.**

1. Ariketa	Eraitzak
1)	$\dot{Q} = 554,1 \text{ [W]}$
2)	$\dot{Q} = 1285 \text{ [W]}$
3)	$\dot{Q} = 660,6 \text{ [W]}$
4)	$\dot{Q} = 2500 \text{ [W]}$
5)	$\dot{e}_{gen} = 200 \text{ [W/m}^3\text{]}$
6)	$T(x) = -50x^2 + 25,555$
7)	$T(x = 0,05 \text{ m}) = 25,43 \text{ [}^\circ\text{C]}$
8)	$T(x = 0 \text{ m}) = 25,555 \text{ [}^\circ\text{C]}$

2. Ariketa	Eraitzak
1)	$h = 4,961 \text{ [W/m}^2\text{}^\circ\text{C]}$
2)	$T_{azalera} = 99,05 \text{ [}^\circ\text{C]}$
3)	$T_{ardatza} = 99,05 \text{ [}^\circ\text{C]}$
4)	$\dot{Q} = 319,033 \text{ [KJ]}$
5)	$h = 4,45 \text{ [W/m}^2\text{}^\circ\text{C]}$
6)	$T_{azalera} = 111,96 \text{ [}^\circ\text{C]}$
7)	$T_{ardatza} = 163,73 \text{ [}^\circ\text{C]}$
8)	$t = 2,24 \text{ ordu}$

3. Ariketa	Eraitzak
1)	$F_{11} = 0; F_{12} = 0.2; F_{13} = 0.8; F_{21} = 0.2; F_{22} = 0; F_{23} = 0.8; F_{31} = 0.2; F_{32} = 0.2; F_{33} = 0.6$
2)	$\dot{Q}_{2 \rightarrow 3} = -985021,248 \text{ [W]}$
3)	$\dot{Q}_{2 \rightarrow 1} = 20938,42 \text{ [W]}$
4)	$\dot{Q}_2 = 964082,828 \text{ [W]}$

2012-13 Kurtsoa. Uztaileko azterketa.

Curso 2012-13. Examen julio.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
a)	15719 [W/m ³]
b)	$T(x) = -1571.9 x^2 + 55.32$
c)	$T(x) = -78.595 x + 56.3$
d)	$T = 51.2$ [°C]
e)	Ez
f)	$\dot{Q} = 3181.267$ [KW]
g)	$\dot{m} = 1.41$ [$\frac{Kg}{s}$]
h)	$t = 1.92 \cdot 10^{-4}$ [hr]

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
a)	$h = 26.52$ [$\frac{W}{m^2 \cdot ^\circ C}$]
b)	$\dot{Q} = h A_s (T_s - T_\infty) = 26.52 \cdot 1.885 \cdot \left(\frac{80 + T_2}{2} - 18 \right)$
c)	$Q = m \cdot c_p \cdot (T_2 - T_1) = 181.3 \cdot 4197 \cdot (80 - T_2)$
d)	$T_2 = 75.9$ [°C]
e)	$\dot{m} = 1.408$ [$\frac{Kg}{s}$]
f)	$h_o = 9002$ [$\frac{W}{m^2 \cdot ^\circ C}$]
g)	$h_i = 7355$ [$\frac{W}{m^2 \cdot ^\circ C}$]
h)	$U = 4048$ [$\frac{W}{m^2 \cdot ^\circ C}$]

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
a)	$F_{11} = 0; F_{12} = 1; F_{21} = 0.563; F_{22} = 0.437$
b)	$\dot{Q}_{12} = 1270$ [W]
c)	$\dot{Q}_{2ext3} = 539.39$ [W]
d)	$\dot{Q}_{conv.} = 730.6$ [W]
e)	$h = 7.383$ [$\frac{W}{m^2 \cdot ^\circ C}$]

2013-14 Kurtsoa. Maiatzeko azterketa.

Curso 2013-14. Examen mayo.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	
2)	$\dot{Q} = 276.7 [W]$
3)	$T = 2.7 [^{\circ}C]$
4)	
5)	$T(x) = -16025.282x^2 - 105.6x + 9.702$
6)	$T = 9.7 [^{\circ}C]$
7)	$\dot{q}_{conv} = 564.8 [W]$
8)	$T = 25.8 [^{\circ}C]$
9)	$\Delta T_{ln} = 11.5 [^{\circ}C]$
10)	$U = 1522 \left[\frac{W}{m^2^{\circ}C} \right]$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$h = 8.459 \left[\frac{W}{m^2^{\circ}C} \right]$
2)	$\dot{Q} = 1353 [W]$
3)	$\dot{Q} = 1502 [W]$
4)	$\dot{Q} = 2855 [W]$
5)	$h = 6.048 \left[\frac{W}{m^2^{\circ}C} \right]$
6)	$\dot{Q} = 284.3 [W]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$\dot{Q} = 1060 [W]$
2)	$\dot{Q} = 515.1 [W]$
3)	$\dot{Q} = 1575 [W]$
4)	$F_{11} = 0; F_{12} = 0; F_{13} = 1; F_{21} = 0; F_{22} = 0; F_{23} = 1; F_{31} = 0.05; F_{32} = 0.45; F_{33} = 0.5;$
5)	$J_1 = 107343 \left[\frac{W}{m^2} \right]; J_2 = 48052 \left[\frac{W}{m^2} \right]; J_3 = 53076 \left[\frac{W}{m^2} \right]$
6)	$T = 983 [K]$
7)	$\dot{Q} = -7990 [W]$

2013-14 Kurtsoa. Uztaileko azterketa.

Curso 2013-14. Examen julio.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	$t = 9197 \text{ [s]}$
2)	$T = 31.9 \text{ [}^\circ\text{C]}$
3)	$t = 1682 \text{ [s]}$
4)	$Q = 260230$
5)	$R = 0.169 \left[\frac{^\circ\text{C}}{\text{W}} \right]$
6)	$\dot{Q} = 41.42 \text{ [W]}$
7)	$\dot{q} = 195.3 \left[\frac{\text{W}}{\text{m}^2} \right]$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$V_{max} = 31.01 \left[\frac{\text{m}}{\text{s}} \right]; Re = 41756 [-]$
2)	$h = 230.3 \left[\frac{\text{W}}{\text{m}^2\text{ }^\circ\text{C}} \right]$
3)	$T = 18.6 \text{ [}^\circ\text{C]}$
4)	$\dot{Q} = 3847 \text{ [W]}$
5)	$h = 208.3 \left[\frac{\text{W}}{\text{m}^2\text{ }^\circ\text{C}} \right]$
6)	$T = 3.7 \text{ [}^\circ\text{C]}$
7)	$U = 224.1 \left[\frac{\text{W}}{\text{m}^2\text{ }^\circ\text{C}} \right]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$F_{11} = 0; F_{12} = 0.8; F_{13} = 0.2; F_{21} = 0.8; F_{22} = 0; F_{23} = 0.2; F_{31} = 0.4; F_{32} = 0.4; F_{33} = 0.2;$
2)	$J_1 = 432.6 \left[\frac{\text{W}}{\text{m}^2} \right]; J_2 = 555.8 \left[\frac{\text{W}}{\text{m}^2} \right]; J_3 = 478.8 \left[\frac{\text{W}}{\text{m}^2} \right]$
3)	$\dot{Q} = 1.14 \cdot 10^6 \text{ [W]}$
4)	$G = 2279 \left[\frac{\text{W}}{\text{m}^2} \right]$

2014-15 Kurtsoa. Maiatzeko azterketa.

Curso 2014-15. Examen mayo.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	$\dot{q} = 162.2 \left[\frac{W}{m^2} \right]$
2)	$\dot{e}_{gen} = 8108 \left[\frac{W}{m^3} \right]$
3)	$T = -\dot{e}_{gen} \frac{x^2}{2k} + 53.17$
4)	$T = -605.1x + 65.25$
5)	$T = 53.15 [^{\circ}\text{C}]$
6)	$\dot{q} = 16.17 \left[\frac{W}{m^2} \right]$
7)	$\dot{q} = 18.25 \left[\frac{W}{m^2 \text{ } ^{\circ}\text{C}} \right]$
8)	$Nu = 102 [-]$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$L_h = 42.31 [m]; L_t = 29.76 [m]; \text{Garapen fasea}$
2)	$h = 0.598 \left[\frac{W}{m^2 \text{ } ^{\circ}\text{C}} \right]$
3)	$\dot{m} = 0.019 \left[\frac{Kg}{s} \right]$
4)	$\dot{Q} = 272 [W]$
5)	$T_{si} = 59.4 [^{\circ}\text{C}]; T_{se} = 73.4 [^{\circ}\text{C}]$
6)	$h = 0.492 \left[\frac{W}{m^2 \text{ } ^{\circ}\text{C}} \right]$
7)	$T_s = 70.5 [^{\circ}\text{C}]$
8)	$\Delta T_{ml} = 4.1 [^{\circ}\text{C}]$
9)	$\Delta P = 0.95 \left[\frac{N}{m^2} \right]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$\dot{Q} = 800 \left[\frac{KW}{m} \right]$
2)	$F_{11} = 0.36; F_{12} = 0.09; F_{13} = 0.54; F_{21} = 0.46; F_{22} = 0.08; F_{23} = 0.46; F_{31} = 0.86; F_{32} = 0.14; F_{33} = 0;$
3)	$J_1 = 45196 \left[\frac{W}{m^2} \right]; J_2 = 30226 \left[\frac{W}{m^2} \right]; J_3 = 17940 \left[\frac{W}{m^2} \right]$
4)	$T_1 = 954 [K]; T_2 = 854.5 [K]$
5)	$\dot{Q}_3 = -800 \left[\frac{KW}{m} \right]$

2014-15 Kurtsoa. Uztaileko azterketa.

Curso 2014-15. Examen julio.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	$\alpha = 5,173 \cdot 10^{-6} \left[\frac{m^2}{s} \right]$
2)	$t = 16080 [s]$
3)	$Q_{max} = 2,152 \cdot 10^6 [J]$
4)	$h = 80 \left[\frac{W}{m^2 \cdot ^\circ C} \right]$
5)	$t = 5025 [s]$
6)	$Re = 384977 [-]; v = 41,27 \left[\frac{m}{s} \right]$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$\dot{Q} = 6105 [W]$
2)	$T_e = 61,5 [^\circ C]$
3)	$U = 12,81 \left[\frac{W}{m^2 \cdot ^\circ C} \right]$
4)	$Re = 413,9 [-]$
5)	$L_h = 4,139 [m]; L_t = 17,11 [m]; Garapen fasea$
6)	$h = 17,98 \left[\frac{W}{m^2 \cdot ^\circ C} \right]$
7)	$h = 45,85 \left[\frac{W}{m^2 \cdot ^\circ C} \right]$
8)	$D_h = 0.02 [m]$
9)	$Nusselt = 25,62 [-]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$\tau = 0,66 [-]$
2)	$G = 968 [W]$
3)	$F_{11} = 0; F_{12} = 0.78; F_{13} = 0.22; F_{21} = 0.44; F_{22} = 0.40; F_{23} = 0.16; F_{31} = 0.44; F_{32} = 0.56; F_{33} = 0;$
4)	$J_1 = 2826 \left[\frac{W}{m^2} \right]; J_2 = 2238 \left[\frac{W}{m^2} \right]; J_3 = 1815 \left[\frac{W}{m^2} \right]$
5)	$\dot{q}_3 = -679,4 \left[\frac{W}{m^2} \right]$
6)	$\dot{q}_2 = -188,2 \left[\frac{W}{m^2} \right]$

2015-16 Kurtsoa. Maiatzeko azterketa.

Curso 2015-16. Examen mayo.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	$\dot{Q} = 15309[W]$
2)	$T = 35.6[^\circ\text{C}]$
3)	$U = 1.077 \left[\frac{W}{m^2^\circ\text{C}} \right]$
4)	$T(x) = C5x + C6$
5)	$T(x) = -26.25x + 19.21$
6)	$\dot{Q} = 8991[W]$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$A = 0.9425 [m^2]; D = 0.6 [m]$
2)	$\frac{Gr}{Re^2} < 0.1$
3)	$\frac{Gr}{Re^2} < 0.1$
4)	$Nu = 55.68[-]$
5)	$h = 2.776 \left[\frac{W}{m^2^\circ\text{C}} \right]; \dot{Q} = 13.08 [W]$
6)	$Nu = 1432[-]$
7)	$Nu = 1432[-]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$F=1$
2)	$\dot{Q} = 17012[W]$
3)	$\varepsilon = 0.06 [-]$
4)	$\dot{Q} = 773.3[W]$
5)	$F_{11} = 0; F_{12} = 0.45; F_{13} = 0.55; F_{21} = 0.45; F_{22} = 0; F_{23} = 0.55; F_{31} = 0.31; F_{32} = 0.31; F_{33} = 0.38;$
6)	$J_1 = 5923 \left[\frac{W}{m^2} \right]; J_2 = 3569 \left[\frac{W}{m^2} \right]; J_3 = 4746 \left[\frac{W}{m^2} \right]$
7)	$\dot{Q} = -13649[W]$

2015-16 Kurtsoa. Uztaileko azterketa.

Curso 2015-16. Examen julio.

1. Ariketa/ Ejercicio 1	Emaitzak/ Resultados
1)	$t = 22.8[\text{ordu}]$
2)	$T = 1.8[^\circ\text{C}]$
3)	$\dot{Q} = 7.626 * 10^6[\text{W}]$
4)	$T(x) = 16.9x - 5$

2. Ariketa/ Ejercicio 2	Emaitzak/ Resultados
1)	$\dot{m} = 0.197 \left[\frac{\text{kg}}{\text{s}} \right]$
2)	$Nu = 108.9[-]$
3)	$h = 4145 \left[\frac{\text{W}}{\text{m}^2\text{C}} \right]$
4)	$\dot{Q} = 9891[\text{W}]$
5)	$h = 2.272 \left[\frac{\text{W}}{\text{m}^2\text{C}} \right]$
6)	$\dot{Q} = 272.7[\text{W}]$
7)	$\dot{q} = 4.544 \left[\frac{\text{W}}{\text{m}^2} \right]$

3. Ariketa/ Ejercicio 3	Emaitzak/ Resultados
1)	$F_{11} = 0; F_{12} = 0.11; F_{13} = 0.89$
2)	$G = 506.9 \left[\frac{\text{W}}{\text{m}^2} \right]$
3)	$J_1 = 538.6 \left[\frac{\text{W}}{\text{m}^2} \right]; J_2 = 645.2 \left[\frac{\text{W}}{\text{m}^2} \right]; J_3 = 490.7 \left[\frac{\text{W}}{\text{m}^2} \right]$
4)	$\dot{Q} = 12680[\text{W}]$
5)	$T_2 = 327.1 [\text{K}]$