Name:	Points:	Evaluation:

A	B	C	D	E.	F
50-45	44-40	39-35	34-30	29-25	<25

1. Which sentence is right?:

a) Sun is closest to Earth at winter b) Sun is closest to Earth at spring

c) Sun is closest to Earth at summer

4 pts

2. What is the „incidence angle“ of solar radiation? definition, e.g. angle between …

6 pts

3. Direct solar radiation is:

a) angle dependent b) angle independent c) isotropic

4 pts

4. What means spectrally selective surface? What parameters of the surface define the selectivity?

6 pts

5. Write a theoretical equation for collector efficiency based on absorber temperature. Describe (name) the quantities in equation, write also the units from them.

6 pts

6. Draw the typical efficiency characteristics for unglazed solar collector and vacuum single tube solar collector in one graph for comparison. Describe the axes!

8 pts

7. Determine the peak (maximum) thermal power and thermal efficiency at fluid temperature 50 °C, ambient temperature 20 °C and irradiance 1000 W/m^2 for solar collector with parameters of efficiency curve $\eta_0 = 0.75$, $a_1 = 4.2$ W/m^{2}K, $a_2 = 0.015$ W/m^{2}K^2, and with reference collector area $A = 5$ m^2

8 pts

8. What are the main components of solar thermal system (name at least 5). Draw a scheme, describe the components.

8 pts