Unit 14 - Recent trends in biosensors and 3D Printing

Week 12 Assignment

Due: 2018-10-22, 23:59:59 ET

1. Properties measured using FTA sensor for tumor tissue phenotyping are:
   - temperature, density, pH, moisture content, oxygen concentration, membrane density, viability, haematopoietic, density, cell count.
   - 2 points

2. The blood vessel diameter y can be derived from the density, density of the tumor, density of the sensor, density of the blood vessel, density of the tissue.
   - 2 points

Diagram:

- Tissue (Resistivity $\rho$, Thermal conductivity $k$)
- ET Sensor

Front view

- a=5mm
- b=5mm
- c=5mm
- Tissue=27°C

Top view

- 5.4 Gm
- 5.9 Gm
- 12.1 mm

Fourier’s Law of Thermal Conduction for a wall

$q = -k \frac{dT}{dx} = kA(T_2 - T_1)/(x_2 - x_1)$

Where,

- $q$ = Heat transferred (W)
- $A$ = Area of cross section (m$^2$)
- $T$ = Temperature (K)
- $x$ = thickness (m)