**Assignment-1**

**Due date for this assignment:**2018-02-21, 23:59 IST.

***1 point***

For a system to be in thermodynamic equilibrium, do the temperature and the pressure have to be the same everywhere?

 Temperature has to be same throughout but not pressure

 Pressure has to be same throughout but not temperature

 Both temperature and pressure should be same throughout

 Both temperature and pressure should not be same throughout

***1 point***

 The maximum blood pressure in the upper arm of a healthy person is about 120 mm Hg. If a vertical tube open to the atmosphere is connected to the vein in the arm of the person, determine how high the blood will rise in the tube. Take the density of the blood to be 1050 kg/m3 and density of mercury to be 13600 kg/m3.

 0.12 m

 1.55 m

 1.00 m

 3.5 m

***1 point***

The deep body temperature of a healthy person is 37°C. What is it in kelvins?

 236 K

 273 K

 310 K

 558 K

***1 point***

For the two paths, one reversible and one irreversible, to change the state of the system from same initial point to same final point for both the paths,

 ΔU, Q, W are same

 ΔU is same

 

  ΔU, Q are different

***1 point***

Electrical power is to be generated in a hydroelectric power plant that receives water at a rate of 85 m3/s from an elevation of 65 m using a turbine generator with an efficiency of 70 percent. When frictional losses in piping are disregarded, the electric power output of this plant is

 45 MW

 53 MW

 38 MW

 65 MW

***1 point***

Which one of the following is an intensive property?

 Temperature

 Volume

 Total energy

 Total enthalpy

***1 point***

A system is said to be an open system when

 there is exchange of energy and mass across the boundary

  there is exchange of only energy across the boundary

 there is exchange of only mass across the boundary

 there is no exchange of energy and mass across the boundary

***1 point***

A 2 kW pump is used to pump kerosene (ρ = 0.82 kg/L) from a tank on the ground to a tank at a higher elevation. Both tanks are open to the atmosphere, and the elevation difference between the free surfaces of the tanks is 30 m. The maximum volume flow rate of kerosene is

 7.2 L/s

 8.3 L/s

 12.1 L/s

 6.8 L/s

***1 point***

 One person jumps from mountain, which is at an elevation 2km from the ground. What is his velocity while traveling at a height of 1.5 km?

 50 m/s

 99.05 m/s

 10 m/s

 200 m/s

***1 point***

Temperature of a gas is produced due to

  its heating value

  kinetic energy of molecules

 repulsion of molecules

  attraction of molecules