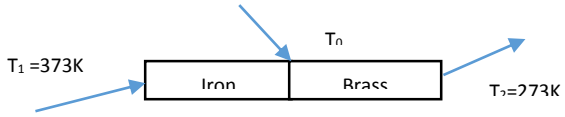
THERMAL PROPERTIES OF FLUIDS

***General Instructions*:** Answer all the questions. If you are unable to answer any question, go through the page number that is given against that particular question in the text book. You can find the answer**.**

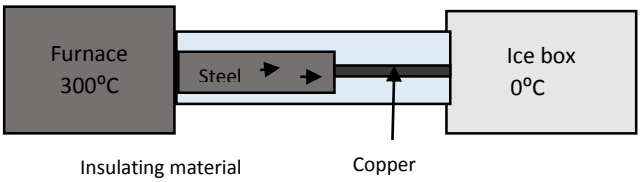
Test Paper-III

MAX MARKS: 30 **TIME: 90Mts**

1	What is meant by sublimation? Give an example for the same. What are the states of a substance which coexist in thermal equilibrium during the process of sublimation?	P284	2
2	Why cooking is difficult on hills? How can we overcome this effect? What is normal boiling point?	P284	2
3	Define what is meant by latent heat of fusion of ice. Give the factors on which the latent heat of fusion of ice depends upon. How does it vary from the latent heat of vaporization of water? Plot the graph showing the variation of Temperature versus heat from water at 1 atm pressure.	P285	3
4	Explain why burns from steam are usually more serious than those from boiling water?	P285	2
5	When 0.15 kg of ice of 0^oCmixed with 0.30 kg of water at 50^oC in a container, the resulting temperature is 6.7^oC. Calculate the heat of fusion of ice. (Specific heat capacity of water is $4186 Jkg^{-1} K^{-1}$)	P285	2
6	Calculate the heat required to convert 3 kg of ice at -12^oC kept in a calorimeter to team at 100^oC at atmospheric pressure. Given specific heat capacity of ice = 2100 $J kg^{-1} K^{-1}$, specific heat capacity of water = 4186 $J kg^{-1} K^{-1}$, latent heat of fusion of ice= $3.35 \times 10^5 J kg^{-1}$ and latent heat of steam= $2.256 \times 10^6 J kg^{-1}$.	P286	3
7	An iron bar (L_1 = 0.1m, A_1= $0.02m^2$, K_1 = $79Wm\text{-}1K^{-1}$) and a brass bar (L_2 = 0.1 m, A_2 = 0.02 m^2, K_2 = $109W\ m^{-1}K^{-1}$) are soldered end to end as shown in fig. The free ends of the iron bar and brass bar are maintained at 373 and 273 K respectively. Obtain expressions for and hence compute (i) the temperature of the junction of the two bars, (ii) the equivalent thermal conductivity of the compound bar, and (iii) the heat current through the compound bar.	P288	3



8	Give the factors on which rate of flow of heat by conduction depends upon. Give the formula to find the same. Define thermal conductivity of a material. What is the importance of it? Give the SI unit of it	P287	3
9	Why people prefer to give a layer of earth or foam insulation on the ceiling?	P287	2
10	An Iron bar at temperature T_1 K having thermal conductivity K_1 and a Brass bar at temperature T_2 K having thermal conductivity K_2 are soldered end to end. Give the formula to find the junction temperature.	P288	1
11	What are the different ways by which heat transfer takes place? What is meant by conduction? How can you compare the conductivities of gases, liquids and solids?	P286	3
12	What is the temperature of the steel-copper junction in the steady state of the system shown in fig? Given that Length of the steel rod=15.0cm, length of the copper rod=10.0cm, temperature of the furnace =300^oC, temperature of the other end = 0^oC. The area of cross section of the steel rod is twice that of the copper rod.(Thermal conductivity of steel = 50.2 J s^{-1} m^{-1} K^{-1}; and of copper = 385 J s^{-1} m^{-1} K^{-1})	P288	3



13	Why some cooking pots have copper coating on the bottom?	P287	1