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-II

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

1	What is meant by thermal stress? Find the thermal stress developed in a steel rail of length 5m and area of cross section 40 cm^2that is prevented from expanding while temperature rises by 10^oC.The coefficient of thermal expansion of steel is 1.2 X $10^{-5}K^{-1}$.Also find the amount of external force required to bend the rails.	P279	3
2	Show that the coefficient of area expansion, $(\Delta A/A)/\Delta T$, of a rectangular sheet of the solid is twice its linear expansivity α_l.	P279	3
3	A blacksmith fixes iron ring on the rim of the wooden wheel of a bullock cart. The diameter of the rim and the iron ring are 5.243m and 5.231m respectively at 27^o C. To what temperature should the ring be heated so as to fit the rim of the wheel?	P279	2
4	What are the factors on which the quantity of heat required to raise the temperature of a substance depend? Give the relation to find the same. Define specific heat capacity of a substance.	P280	3
5	What is meant by molar specific heat capacity of a substance What is the SI unit of measurement of it? How does it vary from molar specific heat at constant volume?	P280	3
6	Name the substance which has high specific heat capacity. Also explain why in desert areas, the earth surface warms up quickly during the day and cools quickly at night?	P281	3
7	Name the device used for measuring heat. Give a brief description of a calorimeter	P281	2
8	A sphere of aluminium of 0.047kg placed for sufficient time in a vessel containing boiling water, so that the sphere is at 100^oC. It is then immediately transferred to 0.14kg copper calorimeter containing 0.25kg of water at 20^oC. The temperature	P281	3

	of water rises and attains a steady state at 23^{o}C. Calculate the specific heat capacity of aluminium.		
9	Define normal melting point of a substance. ? What are the two states of the substance which are in thermal equilibrium at melting point of a substance? Plot a graph showing the variation of temperature with time in case of water. Also briefly explain what will you understand from the graph?	P282	3
10	What is meant by regelation? Also state why skating is possible on snow?	P282	2
11	What do you call the point at which the liquid and vapour states of a substance coexist? What do you call such a state?	P283	2
12	What is meant by triple point of a substance? State for what values of temperature and pressure the triple point of water exists?	P283	1