



Name: Program Mark

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ATTEMPT ALL QUESTIONS

1-a) Is the equation $E=2G(3+v)$ dimensionally correct? Why? (E is the Young's modulus, G is the shear modulus and v is the Poisson's ratio). (4 marks)

(b) Sketch a diagram for the Stress-Strain behavior of ductile materials. (4 Marks)

(c) What force is required to stretch wire 1cm^2 in cross-section to double its length? (Young's modulus of elasticity = $2 \times 10^{11} \text{ N/m}^2$, Yield stress = $3 \times 10^{11} \text{ N/m}^2$). (4 Marks)

2-a) What is the applications of Zeroth Law of Thermodynamics?

(4 Marks)

b) If 10g of steam at 100 °C is introduced into a mixture of 200g of water and 120g of ice. find the final temperature and composition of the mixture.

($c_{ice} = 0.5 \text{ cal/g.}^{\circ}\text{C}$, $c_{water} = 1 \text{ cal/g.}^{\circ}\text{C}$, $L_f = 80 \text{ cal/g}$ and $L_v = 540 \text{ cal/g}$).

(4 Marks)

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Good luck

Examiners: Prof. Abed Nasr, Prof. Somia Elhefnawy, A.Prof. Mirvat Abo-Elkhier, Dr. Hany Alnattar

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