Department of Chemical Engineering

Minor I. CHL 766. Interfacial Engineering

Max. Time: 2 Hr Max. Marks: 40

Q. 1. It is proposed to conserve water by retarding evaporation from a large reservoir of water using the concepts of interfacial engineering. Explain how you would do this? (4 marks)

Q. 2. A very thin nylon rope is to be drawn continuously from an interfacial system. How would you achieve this in a laboratory? (4 marks)

Q. 3. Discuss the relative magnitudes of resistances offered by gas film, interface, and liquid film for mass transfer in a gas-liquid system. (3 marks)

Q. 4. How are spreading coefficient, and works of adhesion and cohesion related? Derive this relationship. (4 marks)

Q. 5. What are gravity and capillary waves? How is the velocity of a wave calculated if properties of liquid and wavelength are specified? (4 marks)

Q. 6. Show that the total surface energy is practically independent of temperature. (4 marks)

Q. 7. Define the following terms:

i. Surface compressibility

ii. Surface viscosity

iii. Surface pressure

iv. Ostwald ripening

v. Contact angle

vi. Sessile drop

vii. Micelles (7 marks, 1 mark each)

Q. 8. Explain the concept and manufacture of any one of the chemical products of interfacial engineering of your choice. (10 marks)
