1. Explain why a “spurious regression” problem may be present when estimating a relationship between non-stationary economic variables and discuss the consequences of this. Explain, giving economic illustrations, the concept of cointegration and how it can help to address this problem. Give a detailed description of the ADF unit-root test and its use in testing cointegration.

2. Explain tests that you could use to examine whether the coefficients in a regression equation exhibit structural change at a particular date. Discuss why it would be important for these tests that you also conduct other diagnostic tests of the equation, and describe which additional tests would be useful. How would you test for structural change if its date is uncertain?

3. Explain, with reference to an empirical economic illustration, how you would formulate and estimate a suitable model for a binary choice facing a group of utility-maximising consumers. Describe how you would construct “marginal effects” to assist interpretation of the estimated model. How would you test the distributional assumption in the case of a probit model?

4. Explain the problem of endogenous selection and its consequences for the estimation of a regression equation. Describe a simple model for endogenous selection and explain how you would estimate it using a simple 2-step estimator. Discuss the issue of identification in models of this type.