Faculty of Actuaries Institute of Actuaries

EXAMINATIONS

11 April 2000 (am)

Subject 107 — Economics

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Write your surname in full, the initials of your other names and your Candidate's Number on the front of the answer booklet.*

2. *Mark allocations are shown in brackets.*

3. *Attempt all 37 questions; answer the 26 multiple questions continuously and then begin each answer from question 27 on a separate sheet.*

Graph paper is not required for this paper.

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet and this question paper.

In addition to this paper you should have available Actuarial Tables and an electronic calculator.

For questions 1–26 indicate in your answer booklet which one of the answers A, B, C or D is correct.

1 A maximum price is set for Good X at £20 which happens to coincide with the free market price. A decrease in the demand for Good X keeping the maximum price fixed at £20 will lead to:

A no change in price and a surplus.
B a fall in price and a surplus.
C a fall in price and a shortage.
D a fall in price and a fall in the number of units sold. [1½]

2 Which one of the following is NOT a characteristic of a normal good?

A It has a positive income elasticity of demand.

B A price fall will lead to a rise in demand.

C The substitution and income effects of a price change work in opposite directions.

D The substitution effect of a price fall has a positive effect on demand. [1½]

3 Under what conditions should a profit maximising firm definitely keep open its production in the short run?

A When average fixed cost is above average revenue and average fixed costs are less than average variable costs.

B When average revenue is above average variable cost.

C When average revenue is above average fixed costs.

D When total revenue is above total fixed costs and total fixed costs are less than total variable costs. [1½]

4 If a demand curve is described as having a price elasticity of minus unity throughout itsentire length, this means that the demand curve is:

A a straight line and total expenditure is the same at all prices.
B not a straight line and total expenditure rises as price rises.
C not a straight line and total expenditure is the same at all prices.
D a straight line and total expenditure falls as price rises. [1½]

5 The price of good X is twice the price of good Y. A consumer spends all his income on the two goods, the consumer is in equilibrium when which one of the following conditions is met?

A The marginal utility of Good X is equal to the marginal utility of Good Y.

B The ratio of the quantity of Good X to the quantity of Good Y is equal to the ratio of the price of good X to the price of good Y.

C The marginal utility of Good X is twice the marginal utility of Good Y.

D The total utility of Good X is twice the total utility of Good Y. [1½]

6 Which one of the following is TRUE:

A Diseconomies of scale means that the ratio of inputs to outputs rises as output rises.

B The minimum efficient scale is the point at which long run average costs must begin to fall.

C In the long run a firm cannot alter its fixed costs of production.

D Constant returns to scale means that if a firm doubles its inputs then output remains the same. [1½]

7 A managing director of a monopoly firm is given the following data:

Marginal revenue = £9
Marginal cost = £10
Average cost = £11
Average revenue = £15

To maximise profits the firm should:

A reduce price and increase output.
B reduce price and reduce output.
C increase price and increase output.
D increase price and reduce output. [1½]

8 A movement along a consumer's indifference curve from left to right means that the consumer's

A marginal utility will rise.
B total utility will be unchanged.
C marginal utility will fall.
D money income is unchanged. [1½]

9 Which one of the following conditions indicates that a firm is operating in a monopolistically competitive industry rather than a perfectly competitive industry?

A Output of the firm is where marginal revenue equals marginal cost.

B The cost curves of the firm are U shaped.

C The marginal revenue of the firm is below its average revenue.

D The marginal cost curve cuts the average cost curve at its minimum point. [1½]

10 Consider the following table:

Units of capital	*Units of labour*	*Output*
10	1	100
10	2	190
10	3	270
10	4	340
10	5	400

The table illustrates which one of the following:

A increasing returns to scale.
B constant returns to scale.
C decreasing returns to scale.
D diminishing marginal productivity.

[1½]

11 The principle of diminishing marginal utility of wealth implies that a risk averse individual will be prepared to insure himself against an event:

A even though the expected return is negative.
B only if the expected return is zero.
C only if the expected return is positive.
D only if the event has a high probability of occurrence. [1½]

12 A budget line shows an individual's expenditure constraints. If the price of the good measured on the vertical axis goes up by a bigger percentage than the price of the goodmeasured on the horizontal axis then the budget line will:

A not change position.
B be steeper than before.
C be flatter than before.
D shift to the right. [1½]

13 A profit maximising firm has fixed costs of £40 and the marginal costs of production shown in the table below. The firm can sell as much of its output as it wishes at a fixed price of £100 each. How much profit does the firm make?

Quantity Produced	*Marginal Cost (£)*
1	40
2	60
3	80
4	100
5	120
6	140

A £20
B £60
C £80
D £120 [1½]

14 If a country has negative net property income from abroad then:

A Gross Domestic Product is greater than Gross National Product.

B Gross Domestic Product is less than Gross National Product.

C Gross Domestic Product is the same as Gross National Product.

D we cannot say whether Gross Domestic Product differs from Gross National Product from this information. [1½]

15 Which one of the following statements about real variables in the economy is always TRUE?

A Real interest rates are negative if the nominal interest rate exceeds the expected inflation rate.

B If nominal Gross Domestic Product (GDP) falls by 10 per cent and the GDP deflator falls by 2 per cent then real GDP has risen.

C If real wages rise then this must mean that the domestic price level has fallen.

D If the nominal money stock is constant and the general price level falls then the real money stock will have risen. [1½]

16 The monetary base is £300 billion, the public's cash to deposit ratio is 0.35 and the broad money supply is £450 billion. What is the reserve to deposit ratio of the banking system?

A 2
B 0.9
C 0.55
D 0.23 [1½]

17 Government attempts to increase the narrow money supply through open market operations are likely to cause short term interest rates to:

A rise and reduce money demand.
B rise and raise money demand.
C fall and reduce money demand.
D fall and raise money demand. [1½]

18 Unanticipated inflation:

A increases the opportunity cost of holding money and redistributes wealth from fixed rate borrowers to lenders.

B increases the opportunity cost of holding money and redistributes wealth from fixed rate lenders to borrowers.

C reduces the opportunity cost of holding money and redistributes wealth from fixed rate borrowers to lenders.

D reduces the opportunity cost of holding money and redistributes wealth from fixed rate lenders to borrowers. [1½]

19 Assume that the actual rate of unemployment is below the natural rate of unemployment because the expected rate of inflation is below the actual rate of inflation. If the expected rate of inflation rises to equal the actual rate of inflation then real wages will eventually:

A fall and real output rise.
B fall and real output will fall.
C rise and real output will rise.
D rise and real output will fall. [1½]

20 Which of the following characterises the views of a monetarist?

A In the long term unemployment can be reduced by an expansionary fiscal policy.

B In the long term unemployment can be reduced by an expansionary monetary policy.

C In the long term unemployment is unaffected by monetary policy.

D In the long term unemployment can be reduced but only at the cost of a higher rate of inflation. [1½]

21 Given the following data for an economy:

Consumer expenditure	£70 million
Investment	£20 million
Government expenditure	£40 million
Exports	£10 million
Imports	£30 million
Capital depreciation	£20 million
Net property Income from abroad	£10 million

What is the value of its Net National Product?

A £90 million
B £100 million
C £110 million
D £120 million [1½]

22 Other things being equal, an increase in the fiscal surplus will lead to a:

A rise in long term interest rates.
B increase in the money supply.
C a rise in bond prices.
D none of the above. [1½]

23 Which one of the following will increase the size of the multiplier?

A An increase in the marginal propensity to import.
B An increase in the marginal tax rate.
C A decrease in the marginal propensity to consume.
D A decrease in the marginal propensity to save. [1½]

24 If savings exceed investment by £100 million and government tax revenue exceeds government expenditure on goods and services by £200 million then which of the following applies to net exports?

A Net exports are £100 million.
B Net exports are – £100 million.
C Net exports are – £300 million.
D Net exports are £300 million. [1½]

25 If the current account is in surplus then which of the following applies to the trade account?

A It must be in surplus.
B It must be in deficit.
C It must be in balance.
D It is not possible to say which of the above is applicable. [1½]

26 The current dollar ($) per pound (£) exchange rate is $1.50. The forecast for inflation rates for the year is 6% for the United States and 4% for the United Kingdom. What would be the forecast for the dollar-pound exchange rate one year from now if purchasing power parity applies?

A $1.65
B $1.53
C $1.47
D $1.35 [1½]

27 Draw a diagram to illustrate each of the following:

(i) a demand curve for an inferior but non Giffen good. [1]

(ii) a demand curve for a Giffen good. [1]

(iii) a demand curve with minus unity price elasticity. [1]

(iv) a supply curve with unity price elasticity. [1]
[Total 4]

28 Read parts (i) to (iv) before answering. Answer all parts on the same diagram.

A consumer has an income of £1000 all of which is spent on a combination of Goods X and Y. Good X costs £25 per unit and Good Y costs £20 per unit. Good X is an inferior good and Good Y is a normal good.

(i) Draw the budget line of the consumer, labelling the quantities of Good X and Good Y at the points where the budget line meets the Good X and Good Y axes. Label the budget line as B1. [1]

(ii) Draw an indifference curve for Good X and Good Y at a point where the consumer is maximising his satisfaction. Label the indifference curve IC1. Mark the quantities of X and Y consumed as X1 and Y1 respectively. [1]

(iii) Draw a new budget line to show what would happen to the budget line if the consumer's income rose to £2000. Label the budget line as B2. [1]

(iv) Draw a new indifference curve for Good X and Good Y at a point where the consumer is maximising his satisfaction following the change in income. Label the indifference curve IC2. Mark the quantities of X and Y consumed as X2 and Y2 respectively. [2]

[Total 5]

29 Consider the following options A to E. Each option relates to an individual firm operating under a certain market structure.

Option	*Marginal cost*	*Average cost*	*Marginal revenue*	*Average revenue*
A	20	20	20	20
B	24	18	24	24
C	30	36	30	40
D	18	28	28	40
E	40	40	20	40

(i) Which option indicates a short run equilibrium output for a profit maximising monopolist? [1]

(ii) Write down ALL the options that indicate that a firm is both profit maximising and making excess profits. [1]

(iii) Write down ALL the options that indicate that the firm could reduce its output and increase its profits. [1]

(iv) Write down ALL the options that would be consistent with a perfectly competitive firm in long run equilibrium. [1]

[Total 4]

30 State FOUR factors which will make the demand curve for a good more price elastic, other things being equal. [4]

31 Read both parts (i) and (ii) before answering.

(i) Draw a diagram to show a firm in a perfectly competitive industry making a loss sufficiently small that it pays the firm to continue to operate in the short run. Make sure you use the following labels, AC1 for the average total cost curve, AVC1 for average variable cost curve, MC1 for the marginal cost curve, MR1 for marginal revenue schedule, AR1 for the average revenue schedule, P1 for price and Q1 for quantity. [2]

(ii) Illustrate on the diagram drawn in part (i), the long run equilibrium price and quantity of the firm assuming all the cost curves remain unchanged. Mark the new revenue curves as MR2 and AR2, and P2 and Q2 for the long run equilibrium price and quantity. [2]

[Total 4]

32 (i) Explain the difference between diminishing marginal productivity and diseconomies of scale as they relate to average cost curves. [3]

(ii) State what is meant by the law of diminishing marginal utility in consumption. [1]

[Total 4]

33 You are given the following data on an economy:

	£ millions
Investment expenditure	20
Government expenditure on good and services	70
Exports	50

Notes:

(a) All tax revenues are derived from a uniform rate of income tax of 50% of income.

(b) Consumption expenditure is given by:

$$C = 0.8\ Yd$$

where Yd is disposable national income (i.e. income less taxes)
C is consumption expenditure

(c) Import expenditure is given by:

$$Z = 0.1\ Y$$

where Y is national income
Z is import expenditure

(i) Calculate the equilibrium value of national income. [1]

(ii) Calculate the current account balance at the equilibrium value of national income. [1]

(iii) Calculate the fiscal surplus (+) or deficit (–) at the equilibrium value of national income. [1]

(iv) Calculate the effect of a rise in government expenditure of £14 million on the current account. [1]

[Total 4]

34 Briefly discuss the long run effects of lower (but still positive) domestic inflation on the following variables, while inflation in the rest of the world is zero.

(i) The level of nominal wages in the long term. [2]

(ii) The exchange rate of the domestic currency. [2]

[Total 4]

35 Define the following:

(i) the Public Sector Borrowing Requirement. [1]
(ii) the National Debt. [1]
(iii) Direct taxes. [1]
(iv) Progressive taxation. [1]

[Total 4]

36 (i) With the aid of a numerical example, explain briefly the concept of the multiplier. [2]

(ii) Explain briefly the relationship between the accelerator and the business cycle. [2]

[Total 4]

37 (i) "Inflation imposes heavy costs upon an economy and can be caused by either cost-push or demand-pull factors." Discuss. [10]

(ii) Explain the theory behind how monetary policy can be used to control inflation and discuss some of the practical problems associated with using monetary policy to control inflation. [10]

[Total 20]