Faculty of Actuaries   **Institute of Actuaries**

EXAMINATION

8 September 2006 (am)

Subject CT7 — Economics
Core Technical

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1.   Enter all the candidate and examination details as requested on the front of your answer booklet.

2.   You must not start writing your answers in the booklet until instructed to do so by the supervisor.

3.   Mark allocations are shown in brackets.

4.   Attempt all 37 questions. From question 27 onwards begin each answer on a separate sheet.

5.   Candidates should show calculations where this is appropriate.

Graph paper is available on request but is not required for this paper.

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

> *In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.*

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

1 The solution to the economic allocation problem of deciding WHICH goods to produce requires:

    A   a choice between the production of consumer goods and the production of capital goods

    B   the establishment of freedom of entry and exit

    C   the establishment of a system of market prices

    D   a decision to be made on the degree to which capital will be used in the production process rather than labour

[1½]

2 The limits on the output of finished goods as imposed by a limited supply of productive inputs may be shown on a diagram whose axes are:

    A   quantity of productive inputs
    B   quantity of inputs on one axis and quantity of outputs on the other axis
    C   quantities of finished goods
    D   prices of productive inputs

[1½]

3 Which one of the following will NOT shift the supply curve for Good X to the right?

    A   An increase in labour productivity in industry X.
    B   A fall in price of raw materials used to produce Good X.
    C   An increase in real wages in industry X.
    D   A government subsidy on the production of Good X.

[1½]

4 Good X has a price elasticity of demand equal to minus one. In such circumstances a per unit sales tax on Good X of £10 will lead to which of the following?

    A   A rise in the price charged to consumers of £10.
    B   A rise in the price charged to consumers of less than £10.
    C   No change in the price charged to consumers.
    D   A fall in the price charged to consumers.

[1½]

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5   If Goods X and Y are substitutes, an increase in the price of X causes:

A   the demand curve for Good X to shift to the left, and the demand curve for
Good Y to shift to the left

B   the demand curve for Good X to shift to the left, and the demand curve for
Good Y to shift to the right

C   the quantity demanded of Good X to fall, and the demand curve for Good Y to
shift to the left

D   the quantity demanded of Good X to fall, and the demand curve for Good Y to
shift to the right

[1½]

6   A consumer has £1 of income. Good X costs 20 pence, Good Y costs 20 pence.

The relevant marginal utilities for the consumer are:

Quantity of Good X	Marginal Utility of Good X	Quantity of Good Y	Marginal Utility of Good Y
1	90	1	50
2	60	2	40
3	40	3	30
4	20	4	20
5	10	5	10

The optimum combination of Good X and Good Y for the consumer to purchase is:

A   1 Good X and 4 Good Y
B   2 Good X and 3 Good Y
C   3 Good X and 2 Good Y
D   4 Good X and 1 Good Y

[1½]

7   Which one of the following is TRUE when economies of scale are present?

A   The short run average cost declines.

B   If inputs are doubled then output less than doubles.

C   An increase in the variable factor of production holding the fixed factor of
production constant leads to a higher increase in output.

D   The long run average cost curve declines.

[1½]

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8   For a firm in long run equilibrium in an industry characterised by monopolistic competition:

A   average total cost equals marginal cost
B   average revenue is greater than marginal cost
C   price is greater than average total cost
D   average total cost is less than marginal cost

[1½]

9   Which one of the following statements about market structure is FALSE?

A   Under perfect competition, in the long run all firms make only normal profits.

B   Firms under monopolistic competition produce homogeneous products.

C   Under oligopoly firms make decisions taking into account the possible reactions of their competitors.

D   Under monopoly, a profit maximising firm with positive marginal costs always produces in the region of price elastic demand.

[1½]

10   When a monopolist maximises profits, price exceeds marginal revenue. The difference between price and marginal revenue occurs because:

A   the firm has to charge a price higher than the marginal cost of producing the last unit

B   any decision by the monopolist to sell an additional unit of output does not affect product price

C   the firm has to reduce the price on all previous units sold in order to sell the additional unit

D   the law of diminishing returns directly affects the price of an imperfectly competitive firm's price

[1½]

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11   The idea that an oligopolistic firm faces a kinked demand curve is based upon the assumption that:

    A   a firm's competitors match both its price increases and price decreases

    B   one firm in the industry sets the price for all other firms

    C   a firm's competitors match its price reductions but ignore its price increases

    D   prices can either rise or fall; it depends on what happens to a firm's competitors' prices

[1½]

12   If the price of Good X has risen and the quantity sold has increased then there must have been a:

    A   rightward shift of the supply curve for Good X
    B   leftward shift of the supply curve for Good X
    C   rightward shift of the demand curve for Good X
    D   leftward shift of the demand curve for Good X

[1½]

13   According to marginal revenue productivity theory the wages paid to workers in a perfectly competitive firm which produces Good X will be equal to:

    A   the price of Good X times the marginal product of capital
    B   the price of Good X times the marginal product of labour
    C   the price of Good X divided by the marginal product of labour
    D   the marginal product of labour divided by the price of Good X

[1½]

14   Which of the following does NOT form part of the UK national income:

    A   salaries of firemen
    B   dividend payments to shareholders
    C   state pension payments
    D   company profits

[1½]

PLEASE TURN OVER

15   When taxes on all income are progressive then as income for an individual increases:

A   the marginal tax rate will be less than their average tax rate

B   the marginal tax rate will be greater than their average tax rate

C   the marginal tax rate will be equal to their average tax rate

D   the marginal tax rate will initially be less than but eventually greater than their average tax rate

[1½]

16   The three leakages from the circular flow of income are:

A   savings, taxes and import expenditure
B   savings, taxes and government expenditure
C   investment, government expenditure and exports
D   investment, saving and taxes

[1½]

17   In a simple closed economy with a marginal propensity to consume of 0.75, what would be the effect on the level of aggregate expenditure of an increase in autonomous investment of £20 million?

A   Aggregate expenditure would rise by £5 million.
B   Aggregate expenditure would rise by £15 million.
C   Aggregate expenditure would rise by £26.6 million.
D   Aggregate expenditure would rise by £80 million.

[1½]

18   The data on an economy are:

Consumer Expenditure	£70 million
Investment	£20 million
Government Expenditure	£40 million
Exports	£20 million
Imports	£30 million
Net Property Income from abroad	£10 million

What is the value of its Gross National Income (or Gross National Product)?

A   £150 million
B   £130 million
C   £120 million
D   £110 million

[1½]

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19 Which one of the following situations will lead to the most crowding out of private sector investment following an increase in government expenditure?

A   The demand for money is interest elastic and private investment is interest inelastic.

B   The demand for money is interest inelastic and private investment is interest elastic.

C   The demand for money and private investment are both interest inelastic.

D   The demand for money and private investment are both interest elastic.

[1½]

20 The narrow money supply is increased when:

A   the government spends more money
B   the government buys Treasury bills from the public
C   a citizen buys a newly issued corporate bond
D   a firm obtains an overdraft from a bank

[1½]

21 Which one of the following statements about real variables in the economy is FALSE?

A   If nominal Gross Domestic Product (GDP) rises by 8 per cent and the GDP deflator rises by 5 per cent then real GDP per capita must have risen.

B   A nominal depreciation of a country's exchange rate represents a real depreciation if the domestic inflation rate is less than the foreign inflation rate.

C   An increase in real income will lead to a rise in the demand for real money balances.

D   Real interest rates are positive if the expected rate of inflation is less than the nominal rate of interest.

[1½]

22 Which one of the following would NOT constitute a demand side economic policy for reducing unemployment?

  A   Increased government expenditure on domestically produced goods.
  B   Increased money supply.
  C   Reduced corporate and personal taxation.
  D   A privatisation programme.

  [1½]

23 Which of the following will increase the size of the government expenditure multiplier?

  A   An increase in the marginal propensity to save.
  B   A decrease in the marginal propensity to consume.
  C   A decrease in the marginal propensity to import.
  D   An increase in income tax rates.

  [1½]

24 A crucial difference between the approaches of the Monetarist and Keynesian economists to achieving full employment when an economy is in recession is that:

  A   Monetarists advocate the use of an expansionary monetary policy while Keynesians do not

  B   Monetarists advocate the use of an expansionary fiscal policy while Keynesians do not

  C   Keynesians advocate the use of an expansionary fiscal policy while Monetarists do not

  D   Keynesians advocate the use of an expansionary monetary policy while Monetarists do not

  [1½]

25 One way of reducing the natural rate of unemployment would be to increase:

  A   unemployment benefit
  B   government consumption expenditure
  C   information on job availability
  D   the money supply

  [1½]

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26 Country A exports Good X to Country B and imports Good Y from Country B. The price of Good X rises from £5 to £7 and the price of Good Y falls from £10 to £8. Which of the following statements is TRUE about Country A's terms of trade?

A They have improved by 75 per cent.
B They have improved by 37.5 per cent.
C They have deteriorated by 75 per cent.
D They have deteriorated by 37.5 per cent.

[1½]

27 With the aid of supply and demand curves illustrate on four separate diagrams the effects of the following shocks on the supply and demand for cars:

(i) a decrease in consumers' incomes [1]
(ii) a rise in car insurance premiums [1]
(iii) a rise in the real wages of car workers [1]
(iv) a government subsidy for car production [1]

[Total 4]

28 A producer has constant average total costs of production of £1 no matter what level of output is produced. The producer has the following data on weekly sales for Good X at different price levels:

Price (£'s)	Quantity sold
3	300
4	250
5	200
6	150

(i) Draw a diagram to show the relationship between price (horizontal axis) and total profit (vertical axis) from the above data. Clearly indicate the level of profit at each price. [2]

(ii) Calculate the price elasticity of demand for a rise in price from £4 to £5. [1]

(iii) Calculate the approximate marginal revenue associated with changing prices from £5 to £6 respectively. [1]

[Total 4]

29 (i) Briefly explain the law of diminishing marginal utility and how it may relate to the utility derived from the consumption of food. [2]

(ii) Using a diagram depicting the total utility curve discuss the way in which the law of diminishing marginal utility determines its shape. [2]

[Total 4]

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30 (i) Explain what is meant by the term "adverse selection" in connection with insurance. [2]

(ii) Explain what is meant by "risk aversion" and how this differs from "risk neutrality". [2]

[Total 4]

31 (i) Draw a diagram to illustrate the short run profit maximising price and output for a perfectly competitive firm making losses but sufficient revenue to continue production in the short run. Use the following labels: AC1 for average cost curve, MC1 for marginal cost curve, AVC1 for average variable cost curve, MR1 for marginal revenue curve, AR1 for average revenue curve. Also mark on the diagram the price P1, quantity Q1, total cost C2 and variable cost C1. [3]

(ii) Explain why increasing returns to scale are not compatible with an industry structure characterised by perfect competition. [2]

[Total 5]

32 (i) Explain what the LM curve for a closed economy depicts and draw the LM curve labelling the axes carefully. [2]

(ii) Explain two factors that may shift the LM curve to the right in a closed economy. [2]

[Total 4]

33 Given the following data on simple closed economy:

$C = 10 + 0.75Y$
$I = 20$
$G = 40$

where C is consumer expenditure, Y is national income, G is government expenditure on goods and services and I is investment expenditure. All amounts are in £ million. Calculate the following:

(i) the equilibrium level of national income [1]

(ii) consumer savings at the equilibrium level of national income [1]

(iii) the value of injections at the equilibrium level of national income [1]

(iv) the new level of national income if government expenditure increased by £10 million [1]

[Total 4]

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34   You are given the following data:

$$Cp = 0.2$$
$$Cb = 0.2$$

where Cp is the proportion of deposits held by the public as cash and Cb is the proportion of deposits held by the banks as cash.

Use these figures as your starting point in each of your responses. Calculate the:

(i)   broad money supply if the narrow money supply is £200 million   [1]

(ii)   narrow money supply if the broad money supply is £300 million   [1]

(iii)   percentage effect on the broad money supply of an increase in the narrow money supply of 8 per cent   [1]

(iv)   value of the broad money supply if the narrow money supply is £200 million and the public raises its proportion of deposits held as cash to 0.4 while the banks' cash reserve ratio changes to 0.1   [1]

[Total 4]

35   The world consists of two Countries A and B and the only factor of production is labour. In Country A it takes 50 hours to produce one unit of Good X and 50 hours to produce one unit of Good Y. In Country B it takes 15 hours to produce one unit of Good X and 45 hours to produce one unit of Good Y:

(i)   State which country would export Good Y if trade was opened up between the two countries.   [1]

(ii)   State whether both countries would gain from trade if the terms of trade were 1 unit of Good X to be exchanged for 4 units of Good Y.   [1]

(iii)   State which country has a comparative advantage in the production of Good X.   [1]

(iv)   State whether or not, before trade is opened up, Country A must have a lower level of total production of both goods than Country B.   [1]

[Total 4]

CT7 S2006—11   **PLEASE TURN OVER**

36 Complete each of the following statements with the appropriate phrase or word(s):

    (i)   The index of a country's export prices relative to the index of import prices is known as the _____.   [1]

    (ii)   The IS curve shows different combinations of the rate of interest and level of national income for which the _____ market is in equilibrium.   [1]

    (iii)   If the European interest rate is 2 per cent per annum and the United States interest rate is 5 per cent per annum, then the Euro is expected to _____ at _____ per cent per annum against the dollar to compensate international investors.   [1]

    (iv)   The assets demand to hold money is _____ related to the rate of interest.

    [1]

    [Total 4]

37   (i)   Discuss the advantages, disadvantages and potential problems associated with using fiscal policy and monetary policy to boost economic activity in an open economy.   [10]

    (ii)   Discuss the view that the best way for a country to tackle a current account deficit is to devalue its currency. In your discussion look at alternative macroeconomic measures that may be used to reduce the deficit and consider their relative merits.   [10]

    [Total 20]

END OF PAPER