INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

20 April 2012 (am)

Subject CT7 – Business 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 38 questions. From question 27 onwards begin each answer on a separate sheet.*

5. *Candidates should show calculations where this is appropriate.*

Graph paper 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 from the approved list.

1 The main categories of economic resources are:

A natural resources, labour and money.
B labour, money and factories.
C natural resources, capital and factories.
D natural resources, labour and capital.

[1½]

2 In economics the concept of scarcity means:

A all resources will eventually be exhausted.
B there are unlimited resources, we just have an allocation problem.
C there are unlimited wants and limited resources.
D all of the above.

[1½]

3 Good Y has a cross elasticity of demand with respect to Good X of 0.5 and 100 units of Good Y are demanded when Good X costs 50 pence. A rise in the price of Good X to 75 pence will lead to a change in the demand for Good Y to:

A 150 units.
B 125 units.
C 75 units.
D 50 units.

[1½]

4 The demand equation for Good X is $Q_d = 15 - 0.5P$ and the supply equation for Good X is $Q_s = 3 + 2P$, where P is the price. When the price is £6 there will be:

A a surplus of Good X and price will rise.
B a shortage of Good X and price will fall.
C a surplus of Good X and price will fall.
D a shortage of Good X and price will rise.

[1½]

5 A demand curve which has price elasticity of minus one throughout its length will be:

A vertical.
B horizontal.
C upward sloping.
D downward sloping.

[1½]

6 According to the law of diminishing marginal utility, the total satisfaction that a consumer gets from consuming Good X will:

A rise at an increasing rate as consumption of Good X increases.
B rise at a decreasing rate as consumption of Good X increases.
C fall at an increasing rate as consumption of Good X increases.
D fall at a decreasing rate as consumption of Good X increases.

[1½]

7 Adverse selection refers to a situation where:

A having insurance makes an individual less careful.

B having insurance makes an individual more careful.

C the people taking out the insurance are those who have the highest risk.

D the people taking out the insurance are those who have the highest risk aversion.

[1½]

8 Vertical product differentiation refers to differences between products which reflect:

A different consumer's tastes but not different quality products.
B same quality products.
C different quality products reflecting different production costs.
D different varieties offered at the same price.

[1½]

9 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]

10 Which of the following statements is TRUE?

A Marginal physical product is equal to total physical product divided by average product.

B Average physical product is always greater than marginal physical product.

C Marginal physical product can never become negative.

D Average physical product can never become negative.

[1½]

11 A perfectly competitive firm is producing at a level of output where short run marginal cost is rising and exceeds marginal revenue. What should the firm do to maximise its short run profits?

A Reduce its output.
B Raise its output.
C Raise its price.
D Reduce its price.

[1½]

12 For a monopoly, price exceeds marginal revenue 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 price.

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

D of the law of diminishing returns.

[1½]

13 If the demand for Good X is price elastic then the burden of a sales tax on Good X will be borne:

A equally by buyers and sellers.
B more heavily by buyers.
C more heavily by sellers.
D by neither buyers nor sellers.

[1½]

14 A profit maximising oligopolistic firm has marginal cost of £3 at all levels of output and operates under the belief that the demand curve for its output is kinked at a price of £10. Provided its marginal costs are between £2 and £4, it sells its commodity at a price of £10. If new technology reduces its marginal cost to £1.50 at all levels of output the firm should:

A lower the price and raise output.
B maintain the existing price and output.
C lower the price but maintain existing output.
D maintain the existing price and raise output.

[1½]

15 The range of output over which average variable cost falls will be the same as the range over which:

A average physical product falls.
B average physical product rises.
C marginal physical product falls.
D marginal physical product rises.

[1½]

16 What is the combined effect of an increase in the cost of production and a rise in consumer income on the equilibrium price and quantity of an inferior good?

A The effect on price is indeterminate but quantity will fall.
B The effect on price is indeterminate but quantity will rise.
C The effect on quantity is indeterminate but price will fall.
D The effect on quantity is indeterminate but price will rise.

[1½]

17 Assume two countries, with the same level of technology and resources, do not presently trade. In Country X one unit of labour and one unit of capital can produce 20 units of Good A or 15 units of Good B. In Country Y one unit of labour and one unit of capital can produce 50 units of Good A or 25 units of Good B.

Country	*Good A*	*Good B*
X	20	15
Y	50	25

Which of the following is TRUE?

A Country Y has a comparative advantage in the production of Good A.
B Country X has an absolute advantage in the production of Good B.
C Country X has an absolute advantage in the production of Good A.
D Country Y has a comparative advantage in the production of Good B.

[1½]

18 Structural unemployment is unemployment that:

A increases in a recession and falls in a boom.
B arises when the unemployed lack the skills needed by newly created jobs.
C arises when those seeking work give up hope of finding a job.
D occurs as the result of a transition from one job to another.

[1½]

19 Which of the following is a possible explanation for an increase in the average price level and a decrease in real national income?

A An increase in short run aggregate supply.
B A decrease in short run aggregate supply.
C An increase in aggregate demand.
D A decrease in aggregate demand.

[1½]

20 Which of the following statements about the demand for money is FALSE?

A The demand for money is negatively related to the interest rate.

B The demand for money is positively related to the level of national income.

C The demand for money is negatively related to the price level.

D The demand for money can be divided into speculative, precautionary and transactions motives.

[1½]

21 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]

22 The adoption of a policy to reduce the government's budget deficit will involve:

A an increase in aggregate demand and a reduction in real output.
B an increase in aggregate demand and an increase in real output.
C a reduction in aggregate demand and a reduction in real output.
D a reduction in aggregate demand and an increase in real output.

[1½]

23 If the central bank has to intervene in the foreign exchange markets to prevent the home currency from appreciating, then its foreign exchange reserves will:

A decrease and the domestic money supply will rise.
B decrease and the domestic money supply will fall.
C increase and the domestic money supply will rise.
D increase and the domestic money supply will fall.

24 In a country with a population of 25 million people there are 16 million in the total workforce and 2 million unemployed. What is the rate of unemployment?

A 8%
B 11.1%
C 12.5%
D 44%

[1½]

25 Which of the following is least likely to lead to an increase in long run economic growth?

A An increase in the money supply.
B An increase in capital investment expenditure.
C An increase in education expenditure.
D An increase in research and development expenditure.

[1½]

26 If the rate of inflation is lower than the anticipated rate used for negotiating interest rates and wages:

A lenders will gain at the expense of borrowers and employers will gain at the expense of workers.

B borrowers will gain at the expense of lenders and employers will gain at the expense of workers.

C borrowers will gain at the expense of lenders and workers will gain at the expense of employers.

D lenders will gain at the expense of borrowers and workers will gain at the expense of employers.

[1½]

27 (i) Explain with the use of an appropriate formula the term cross price elasticity of Good X and Good Y. [2]

(ii) The demand for Good X is 260 units per year when price is £2.50 per unit.

(a) If the price of Good X falls to £2.00 per unit and demand for Good X increases to 300 units per year, calculate the own price elasticity of demand for Good X. [2]

(b) If consumer income increases from £23,000 to £26,000 per year and demand for Good X rises to 320 units per year, calculate the income elasticity of demand for Good X. [1]

[Total 5]

28 A perfectly competitive firm sells Good X at a market price of £18 per unit. The firm's short run total fixed cost is £450 per day and the daily wage rate paid by the firm is £130 per employee. No other costs are involved in production.

The output of the firm varies with the level of employment as follows:

Number of Employees	*Units of output per day*
0	0
1	22
2	42
3	58
4	66
5	67

If the firm employs three workers per day, determine the firm's daily:

(i) Total Revenue. [1]
(ii) Total Cost. [1]
(iii) Economic Profit. [1]

[Total 3]

29 Outline with the aid of a diagram the four stages of the business cycle. [6]

30 Draw a diagram to represent a firm operating in monopolistic competition in the short run.

Use your diagram to show:

(a) the firm's profit maximising price and level of output.
(b) the area representing total profit.
(c) the effect of an increase in fixed costs.

[5]

31 Explain with the use of examples the following terms:

(a) risk neutral
(b) risk loving
(c) risk averse

[3]

32 The following table shows the consumption schedule for a closed economy. Investment is currently £40bn and the marginal propensity to consume is 0.67.

National income (*Y*) (£bn)	30	60	90	120	150	180	210	240	270	300
Consumption (*C*) (£bn)	20	40	60	80	100	120	140	160	180	200

(i) Calculate the equilibrium level of national income assuming that the government is currently spending £20bn. [1]

(ii) Calculate the level of savings in this economy if the government has a budget deficit of £5bn at the equilibrium level of national income. [2]

Now assume that full employment is achieved at a national income level of £240bn.

(iii) Assuming no change in tax rates, determine the increase in the government expenditure required to achieve full employment. [1]

(iv) Assume that as an alternative measure to changing government expenditure, the amount of taxes levied is changed in order to raise the national income to its full equilibrium level. Determine the change in taxes in this case. [1]
[Total 5]

33 (i) Outline the reasons why the market may fail to provide an environment in which technological change can thrive. [2]

(ii) Outline how the government may intervene in the market to encourage firms to undertake research and development. [2]
[Total 4]

34 The following table represents an economy's labour market:

Average (real) wage rate US $	*Aggregate demand for labour (thousands of workers)*	*Aggregate supply for labour (thousands of workers)*	*Total labour force (thousands of workers)*
20	700	100	200
40	500	200	300
60	350	350	400
80	200	530	600
100	100	700	750

(i) Calculate the following:

(a) the equilibrium wage rate.

(b) the natural level of unemployment.

(c) the level of disequilibrium unemployment that would arise if trade union pressure increased the average (real) wage to US$ 80.

(d) the equilibrium unemployment rate.

[4]

(ii) Draw a diagram to show and explain the impact of an increase in immigration on the labour market equilibrium. [2]

[Total 6]

35 Outline with the use of examples the key characteristics of public goods. [2]

36 Discuss the various categories of unemployment that can exist in an economy. [4]

37 (i) Draw a diagram to show the demand and supply for Good X in Country A which is producing and importing Good X where the world price P_w is below the domestic market equilibrium price of Good X.

Show on your diagram the quantity of Good X supplied in Country A labelled as Q_1, the quantity demanded of Good X in Country A labelled as Q_2 and the amount of Good X imported. [3]

(ii) Now assume that Country A imposes a tariff (t). The new world price after imposing the tariff is still below the domestic market equilibrium price of Good X. Show the new world price P_{w+t} on your diagram following the imposition of the tariff, the new quantity supplied Q_3, the new quantity demanded Q_4 and the amount imported of Good X. [1]

(iii) Explain with the use of your diagram who gains and who loses as a result of Country A imposing a tariff. [2]

(iv) Show on your diagram and explain the impact of the government introducing a subsidy to assist domestic producers of Good X in Country A. [2]

[Total 8]

38 In a large city there are many taxi firms which can provide identical services.

(i) State the type of market structure under which the city's taxi firms operate. [1]

(ii) Explain and show on a diagram the possible changes in a taxi firm's economic profit, price and output given the following events. Use diagrams which are initially in long run equilibrium and take each event separately.

(a) The city council decides to ease traffic congestion by banning cars from inner city areas but not taxis.

(b) The price of petrol and diesel fuel increases.

(c) A new licence fee for all taxis is introduced.

[9]

[Total 10]

END OF PAPER